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A S I A

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Women
for our Wilds

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JANAKI LENIN



Naturalist-author of My Husband and Other Animals, she delights in culture, cuisine, and adventure. When she's not writing, she entertains travellers at her homestay and watches animals from her back porch.



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NANDINI VELHO

A Ph.D. candidate with the James Cook University, Australia, she studies tropical forests and their relationships with people. She is interested in the interface between science and society, especially the contextual role of women and children.

A couple of Oriental Darters Anhinga melanogaster engage in a fierce territorial battle at the Keoladeo National Park, Bharatpur, Rajasthan. For another stunning image by the photographer, turn to page 22, where Rathika Ramasamy is featured along with eight other talented women photographers.

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SANGEETHA KADUR



Passionate about the natural world, she aspires to capture wilderness on paper and canvas; and dreams of travelling to diverse landscapes. She conducts workshops for children and hopes to inspire a new generation of nature artists.



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RUTH PADEL

Poet, novelist, conservationist, critic and author, she teaches poetry at Kings College, London, and has published nine poetry collections, a novel, and eight books of non-fiction including three on reading poetry.

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ON THE COVER

Framed by moss-shrouded trees, a solitary, wild red panda slumbers on an ancient bough in West Bengal's Singalila National Park. Largely vegetarian, these cat-sized mammals lead arboreal lives, descending to the ground when they go out in search of mates. This spectacular, middle-altitude, Himalayan forest dweller is threatened by the usual suspects – devastating habitat loss and to a lesser extent, poaching.

Photographers: Megh Roy Choudhury and Prasanna A.V.



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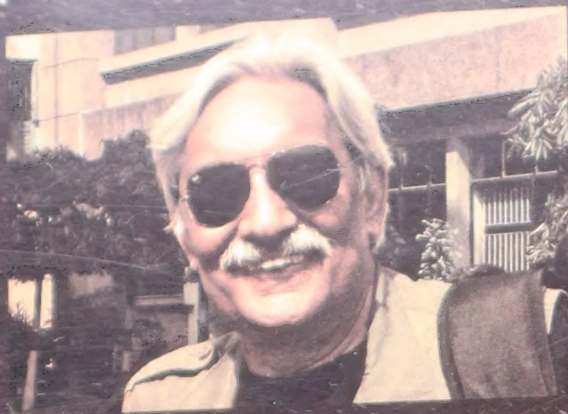


MAKING A DIFFERENCE

"Nature has introduced great variety into the landscape, but man has displayed a passion for simplifying it. Thus he undoes the built-in checks and balances by which nature holds the species within bounds."

— Rachel Carson, *Silent Spring*

For centuries the rough and tumble of outdoor work was considered the exclusive domain of men except for a few women who rarely found recognition in India. Belinda Wright (page 30), Aparajita Datta (page 32), Vidya Athreya (page 41), Bano Haralu (page 47), Rita Banerji (page 52), Divya Mudappa (page 53), Bahar Dutt (page 56), Naina Lal Kidwai and Kiran Bajaj (page 57), Krithi K. Karanth (page 65), Pamela Gale Malhotra (page 78), Debbie Banks and Bina Kak (page 79), Dia Mirza (page 85), Madhu Bhatnagar and Usha Ramaiah (page 99) show how all this has changed as they reflect on their lives and their purpose.



THAT INNER GLOW

Have you ever wondered why some things look stunningly beautiful? Why some moments will live forever in your memory? Why commonplace sights – stars in the night sky; white surf on a blue sea; a flock of birds wheeling in unison – fill you with a sense of indescribable joy and wonder?

It's because you were born a wild animal. You were conceived by nature to respond viscerally to natural phenomena. Your progenitors left you with a whole stack of genetic 'memories'. That sun worship, which is part of virtually every religion on Earth is a result of ancient pre-programmed instincts drilled into your DNA... reminding the 'inner' you that for all the technology, literature, art and accumulated wisdom that surrounds you, you are just as dependent on the sun and on nature as the tiger you travel halfway across the globe to see, the shark with which you dive... or the synchronous-firing fireflies that bedeck this page.

Sanctuary is beholden to conservation photographers such as Bishan Monnappa, who visited a special (secret!) spot in Coorg, night after dark night, for two years until he got lucky and found just the right combination of clear skies, no mist and no moon to allow him to get this image in the precise 45 minutes that the synchronous display of the fireflies took place on April 16, 2015.

Without gifted writers, artists, scientists and poets, so many of them represented in this very issue of Sanctuary, it would be impossible for those of us who have 'seen the light' to share the power and the glory of raw nature with others whose universe does not extend beyond urbania. So, while the vast bulk of our readers feel right at home within the pages of Sanctuary, a critical fragment of decision makers who do not, might just be influenced by some of the still images and moving articulations inspired by your own inner glow.

Prithvi Sahgal



Fireflies in Coorg, Karnataka, photographed by Bishan Monnappa on April 16, 2015. Nikon 800E, Nikon 600 mm. f/4 VR with 1.4x tc f/3.2, 30 sec. on a tripod, ISO 3200, Manual, No Flash.



WORLD SCAN

PRIMATE DISCOVERIES IN CONGO AND TIBET

With support from the Wildlife Conservation Society, a Belgian researcher and his Congolese assistant have rediscovered the Bouvier's red colobus, a primate long thought to be extinct, in the Republic of Congo's Ntokou-Pikounda National Park. The last recorded sighting of the primate was in the 1970s, though local people continued to make mention of the animal. The Bouvier's red colobus is exceptionally vulnerable to poaching due to its trusting nature and is a victim of the bush meat trade. It was previously only known from a few museum specimens.

Meanwhile, a new species of macaque has been identified in Modog County in Tibet. The white-cheeked macaque was discovered by Chinese wildlife photographer Li Cheng, who over the course of several years recorded dozens of images of the primate. Later, with the help of scientists, he was able to determine that the species was distinct from other macaques. "Currently, Modog is the only known habitat of the white-cheeked macaque, though its range may extend to neighbouring counties in China and regions of southeast Tibet controlled by India," said Li. Modog is highly diverse, but threatened by anthropogenic pressures.

Both places are severely threatened by hunting and habitat destruction.

BANGLADESH BORDER FORCE KILL 'INDIAN' TUSKER

Today a historic milestone has been reached in India-Bangladesh relations after the passing of the Constitutional Amendment by Parliament, tweeted the Indian Prime Minister, Narendra Modi on May 7, 2015. This will be no consolation to a wild tusker that wandered into the Rajshahi district of Bangladesh from West Bengal's Murshidabad district only to be gunned down by Bangladesh Border Guards who pumped 34 bullets into the pachyderm, which the West Bengal Wildlife Department was desperately trying to protect by nudging it to stay on the Indian side of the international border. Meaningless protests will be launched. Tongues will be clucked. But we see no signs of cross-border enlightenment on the horizon where wild nature is concerned.

DAN BENNETT/PUBLIC DOMAIN



The large-scale killing of pangolins and the illegal trade in their scales feed the demand for traditional medicines in the Far East.

TARGETED KILLING OF ACTIVISTS RISES

In a chilling report titled 'How Many More?' the organisation Global Witness revealed that the targeted murder of environmental activists increased by 20 per cent in 2014. The organisation recorded a horrifying 116 murders across 17 countries in that year, and published the report with the disclaimer that the death toll is likely much higher. A staggering 40 per cent of the recorded victims were identified as indigenous people.

India too has a track record of silencing dissenting voices, most notably with the murder of activists Amit Jethwa in 2010 and Shehla Masood in 2011.

"Across the world environmental defenders are being shot dead in broad daylight, kidnapped, threatened, or tried as terrorists for standing in the way of so-called 'development'," said Billy Kyte of Global Witness. "The true authors of these crimes – a powerful nexus of corporate and state interests – are escaping unpunished. Urgent action is needed to protect citizens and bring perpetrators to justice."

POLICE BUST MASSIVE PANGOLIN RACKET

In the largest pangolin seizure and raid since 2008, Indonesian authorities, with the support of the Wildlife Conservation Society (WCS), came down with an iron fist on a smuggler, only identified by the initials SHB, in Medan, Sumatra. From a shipping container chartered by him, officials seized five tons of frozen pangolins, 77 kg. of pangolin scales and 96 live animals that were destined for Chinese markets. The value of the seized shipment is estimated at 1.826 million USD.

Pangolins are protected under Indonesian laws, and SHB faces charges that could result in a five year jail term and a maximum fine of 10,000 USD.

WCS Executive Director for Asia Programs Joe Walston said, "This is a major breakthrough, both in terms of the enormous size of the shipment and in terms of the increasing sophistication of collaborative methods used by Indonesian authorities in making the bust. WCS is committed to supporting the Government of Indonesia in dismantling this insidious illegal trade."



INDIA SCAN

TIGERS EXTINCT IN BUXA?

Amidst the news over the growing tiger numbers in the country, alarming statistics emerged from the recently concluded All India Tiger Estimation exercise. The final report of the census submitted to the Ministry of Environment and Forests revealed absolutely no signs of tiger presence in the Buxa Tiger Reserve in West Bengal.

No tiger images have emerged from the camera-trap exercise that was initiated last year. Based on scat samples sent by the Bengal Forest Department to the Wildlife Institute of India (WII), two tigers from Buxa were identified, but the authenticity of those samples is doubted by the WII team, which failed to locate any tiger in the areas from where the samples were apparently collected. In the past too, allegations of scat samples being collected from the adjoining wildlife rescue centre and presented as ones from the wild have come to light.

"We took the GPS coordinates of the scat samples from the state foresters and sent our research team there, but the team didn't find any tiger sign in and around those areas. So, we could not authenticate the origin of the scat," said Dr. Y. V. Jhala of WII.

The experiences of several wildlife researchers, experts and enthusiasts add further weight to these suspicions. From an anonymous researcher who spent two years in Buxa studying elephants and never came across a single tiger or any signs of its presence, to the absence of any cattle-lifting incident in the park's fringe villages says a lot about how dismally low the tiger population in Buxa seems to have plummeted. In the worst case scenario, it is possible that Buxa has tragically gone the way of the Sariska Tiger Reserve that lost all its tigers to poaching in 2004.

In 2004, the Sariska Tiger Reserve in Rajasthan witnessed a disastrous wipeout of its entire tiger population.

NBWL CLEARS ANOTHER ROAD PROJECT

At its 33rd meeting held in March 2015, the National Board for Wildlife (NBWL) upheld its reputation as a clearance house for projects that will impact ecologically vulnerable areas by approving the diversion



SUDHIR KENDHE

The Chestnut Bunting is a migratory, passerine bird that is known to winter in southern China, Southeast Asia and parts of Northeast India

of forestland for a road-widening project in Arunachal Pradesh.

The Standing Committee of the NBWL recommended the diversion of 22.35 ha. of forestland from the Eagle Nest Wildlife Sanctuary and the Sessa Orchid Sanctuary for the upgradation of the Balipara-Charduar-Tawang (BCT) road. The recommendation was issued along with token restrictions to be implemented under the supervision of the Chief Wildlife Warden on the use of explosives and the disposal of debris during construction.

The modification of the 317.52 km. BCT road to the status of a National Highway Double Lane was meant to be completed in 2013, but is now expected to be completed in March 2016. Project proponents have cited border security as the prime reason for the construction but news reports imply that boosting tourism in Tawang is a major incentive for the project.

FIVE NEW TIGER RESERVES APPROVED

The National Tiger Conservation Authority has accorded final approval to the notification of the Rajaji and Kudremukh National Parks, respectively in Uttarakhand and Karnataka as tiger reserves. Simultaneously, in-principle approval has been granted for the creation of tiger reserves in Ratapani, Madhya Pradesh; Sunabeda, Odisha; and Guru Ghasidas, Chhattisgarh.

In addition, Environment Minister Prakash Javadekar declared that a number of states have been advised to send in proposals for the

declaration of tiger reserves within their respective boundaries.

However, all is not rosy. The Karnataka state government has for the past four years opposed the pending notification of Kudremukh as a tiger reserve. Now, the Environment Minister's announcement has been met with resistance by the state, and the true status of Kudremukh remains uncertain.

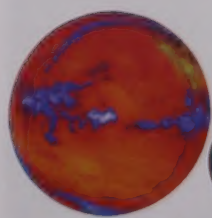
CHESTNUT BUNTING SIGHTED IN MISHMI HILLS

Sudhir Kendhe, a hobby photographer on a birding expedition in the Mishmi Hills of Arunachal Pradesh has recorded what may be the first photographic evidence of a Chestnut Bunting *Emberiza rutila* in the area.

On the afternoon of March 2015, Kendhe was able to sight a flock of six buntings while traveling from Tiwari Gaon to Mayodia Pass. The birds swiftly disappeared into the dense undergrowth, but not before allowing him to take some record shots. Based on their plumage, it appears that the birds were in breeding season.

Read more on
www.sanctuaryasia.com

- FAC Withholds Clearance for Trans-Harbour Link Through Sewri
- Sub-adult Tigress Mowed Down Near Tadoba



CLIMATE WATCH

ARCTIC ECOSYSTEM ALTERED

Ecological niches in nature are never left vacant. Any and every opportunity is seized. And this is being seen in action as orcas or killer whales invade Arctic waters, enabled by passage created by the large-scale melting of ice cover. Scientists have deemed this as the largest invasion of an ecosystem by an 'outsider' species in more than two million years, causing significant and dramatic changes within Arctic and Atlantic biodiversity. The orcas aren't the only invaders from the Pacific ready to displace Atlantic denizens via the Arctic; certain jellyfish, squids and microscopic plants seem to be on their way too.

Higher temperatures have caused the Arctic ice sheet to perilously fragment. The planet is witnessing the smallest ice cover in Arctic waters in centuries. The original apex predator of the Arctic food chain, the polar bears are facing a catastrophic crisis, that is pushing them to the brink of extinction. These large carnivores need ice sheets to be able to pursue and stalk their prey, but waters sans ice is threatening their survival and rendering the fragile ecosystem dangerously altered.

POPE WEIGHS IN ON CLIMATE DEBATE

In a huge fillip to the efforts of climate change activists, the leader of the Catholic Church, Pope Francis, is expected to release a papal encyclical, in essence a policy guideline of the pope's highest teachings, on the issue in July 2015.

For the past year, Pope Francis has been engaging with scientists and experts to understand the impacts of climate change on the world in order to write the encyclical. The document was reportedly completed in April this year. On release, it will be sent to bishops across the world and will address the global population of an estimated 1.2 billion people of the Roman Catholic faith.

This will not be the first time that Pope Francis has been vocal about the issue of global warming. During the Conference of the Parties to the UN Framework Convention on Climate Change, Pope Francis warned members that "the time to find global solutions is running out" and urged for a collective response to the threat of climate change.



A warming planet is causing dramatic changes in Arctic and Atlantic biodiversity.

ONE IN SIX SPECIES FACE EXTINCTION

A report published in *Science*, titled 'Accelerating Extinction Risk from Climate Change', propounds that 16 per cent of all species could go extinct by the end of the century if rising temperatures fuelled by unchecked carbon emissions continue apace. Evolutionary ecologist Mark Urban, lead author of the report, analysed over 130 studies to arrive at this chilling number.

Urban's research also found that the rate of extinction would increase with every 1 °C rise in temperature, and that Australia, New Zealand and the countries of South America are the most vulnerable to climate change-induced extinctions due to the high number of endemic species that they are home to.

NEW SOLAR BATTERY BY TESLA

Elon Musk, the CEO of the American electric car manufacturing company, announced 'The Missing Piece' at the Tesla office in Hawthorne, California on May 1, 2015. At a packed event, he introduced Tesla's latest venture – solar powered lithium ion batteries that have the potential to take energy generation off grid on a large scale.

The solar batteries have been designed in two capacities – the Power Wall that can generate electricity for homes and the much larger version called the Power Pack that can be scaled up to provide as many gigawatts of energy as required – both at

relatively affordable prices starting from \$3,000. Musk asserts that this technology has the power to completely wean countries off the current 'dirty' coal-generated energy that is driving climate change and habitat destruction.

Though Tesla's ambition for these batteries has received criticism from grid analysts who see Musk's expectations as unrealistic, consumers have already given the concept their seal of approval. Within weeks of the announcement, the company has received over 38,000 reservations for the Power Wall home battery.

CLIMATE CHANGE JOLTS TEA INDUSTRY

Erratic weather patterns and uneven rainfall are taking their toll on Assam's famous tea gardens. These anomalies are not just impacting tea yields but are also raising plantation costs for firms like Tata Global Beverages and Jay Shree Tea. The resultant expenses are fast becoming a point of contention between the firms and the daily wage tea pickers who have been lobbying for an increase in their wages.

The changed weather conditions have proved conducive to the proliferation of pest species, as a result of which the use of pesticides and fertilisers has nearly doubled. The increase in the cost of growing tea has consequently led to Indian tea becoming less competitive in the global market.

"With rain so scarce, a day may come when Assam will not grow tea anymore," said tea scientist Subhash Chandra Barua.

Living In Harmony



BISHAN MONNAPPA

Humans are part and parcel of nature and not external to it. It is vital that young India is reminded of our dependency on nature and its capacity to guarantee each of us a decent, safe and fulfilled existence. With your support we can influence change... in the way we do business, in the way we value our forests and natural heritage and how we secure the lives of our children.

**If we protect wild India today, our children
will be safer and they will bless us tomorrow.**



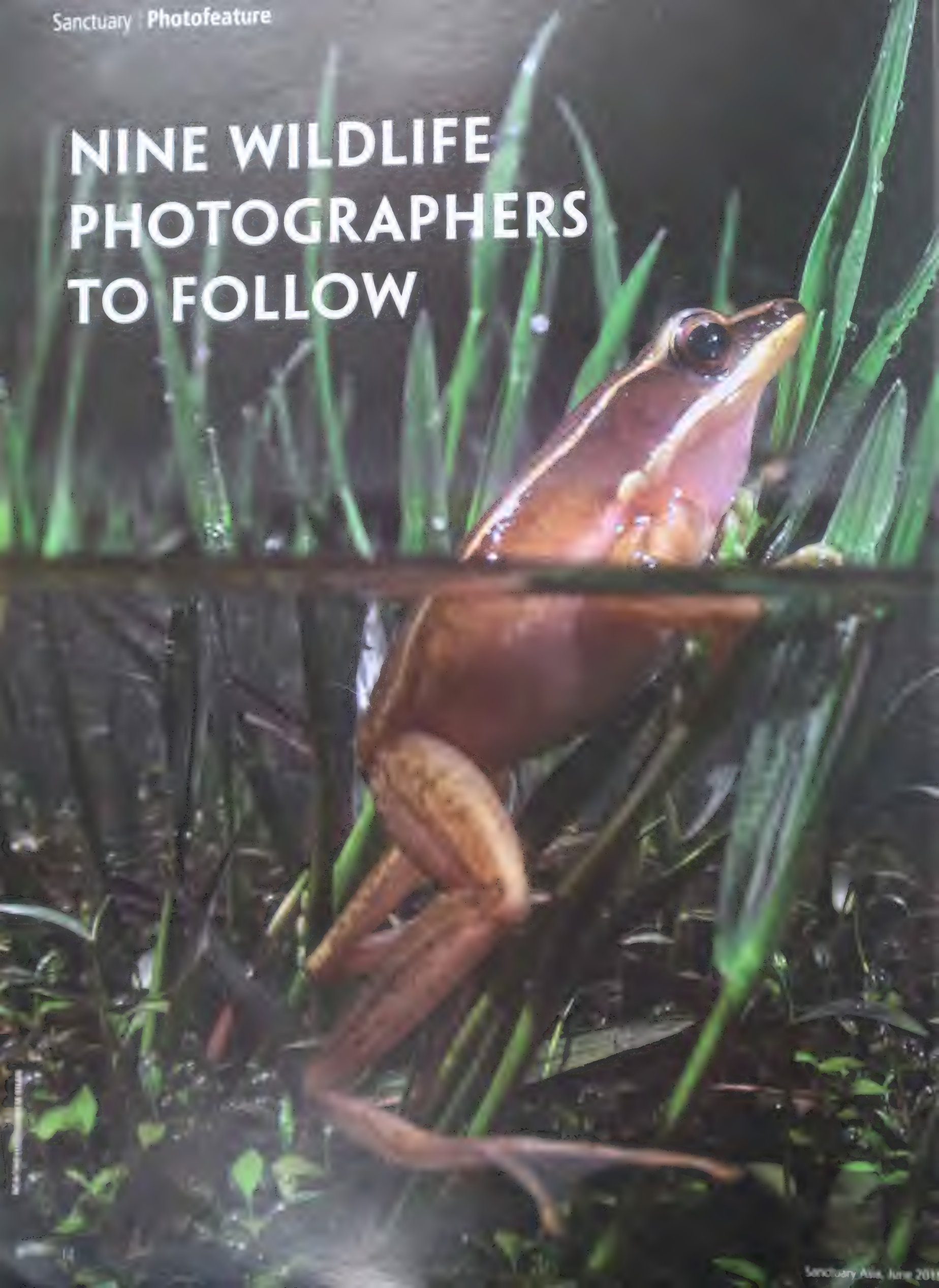
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NINE WILDLIFE PHOTOGRAPHERS TO FOLLOW





Presently the Field Director of the Andaman and Nicobar Islands' Environmental Team, Tasneem Khan believes that science plays a crucial role in conservation. Photography is more than artistic expression for her - it's a medium for observation and learning.

ETHEREAL SUBMERGENCE

The mystical Agumbe Rainforest, drenched in early monsoon showers, brings with it the emergence of stunning wildlife. This handsome golden-backed frog *Hylarana* sp., perched on half-submerged grass stalks, was discovered by Tasneem in a meadow where she lay half-submerged herself, in the middle of the night, braving the cold, wet weather and leeches. The image provides us a glimpse of that other, ethereal world of amphibians, from their vantage point.

The image also made it to the cover of *Saevus* magazine.

Location: Agumbe, Karnataka
Camera: Nikon D300, Lens: Tokina 10-17 mm. +
Sea & Sea underwater housing, Shutter
speed: 1/100 sec., Aperture: f/8, ISO: 400,
Focal length: 17 mm.
Image taken: August 9, 2013; 10:47 p.m.



A former IT professional, Anuradha Marwah now travels extensively to wildernesses across the country, pursuing her passion for wildlife and conservation photography.

UNQUENCHABLE GAZE

This enigmatic feline nonchalantly stepped down from its tree perch, possibly for a drink, when it froze in response to alarm calls echoing in the forest. An awestruck Anuradha watched and photographed in fascination as the leopard hesitated and then in a flash, disappeared into the foliage, leaving her wondering if the golden apparition had been a figment of her imagination.

Location: Tadoba-Andhari Tiger Reserve, Maharashtra
Camera: Canon 7D, Lens: Canon 400 mm, 2.8 + 1.4x TC, Shutter speed: 1/400 sec., Aperture: F/4, ISO: 400, Focal length: 560 mm.
Image taken: November 14, 2013; 5:00 p.m.





Hajra Ahmad let her love for the art of photography lead her down the wildlife road. After specialising in wildlife and travel photography, she set base in Ranthambhore as a Camp Manager at Sher bagh.

COMING HOME

The purity of this tender moment reveals the happiness and relief of a cub on the return of her mother who managed to bring back a hard-won kill. The image captures the emotion that most people do not believe animals possess. The truth is that wild creatures are temperamental, sensitive and intelligent. Love and caring is not the exclusive domain of humans.

Location: Ranthambhore Tiger Reserve, Rajasthan
 Camera: Canon EOS 5D, Lens: Canon 70-200 mm, f/2.8,
 Shutter speed: 1/1250 sec., Aperture: f/2.8, ISO: 1250,
 Focal length: 200 mm.
 Image taken: March 3, 2015, 5:32 p.m.





Arati Kumar-Rao is an environmental photographer and journalist documenting the effects of land-use and river-use change on ecosystems, lives, and livelihoods.

BRAWLING BULLS

The dramatic scene of the two handsome bulls engaged in a mock fight unfolded under threatening, overcast skies, across the banks of Sri Lanka's Mahaweli river. Arati captured this picture-perfect frame knowing that elephant herds gather here to gorge on the nutritious grass that grows wild and free on mud banks that are exposed when the waters recede.

Location: Banks of the Mahaweli river, Sri Lanka

Camera: Nikon D7000, Lens: Nikon 70-300 mm., Shutter speed: 1/8000 sec., Aperture: f/2.8, ISO: 400, Focal length: 24 mm.

Image taken: August 28, 2011; 5:32 p.m.





A Bengaluru-based wildlife photographer and filmmaker, Sugandhi Belur is driven by her love for wildlife and the art of photography and regularly volunteers with wildlife and conservation organisations.

STEPPING INTO A PAINTING

This breathtaking, surrealistic capture beckons you into a forest wonderland where a mystical antelope and a bird are ready to lead the way. Sugandhi Belur was at the beautiful Keoladeo National Park in Bharatpur, Rajasthan, when winter was coming to a graceful end, setting the perfect scene of a breaking dawn with just the right amount of mist and sunlight.

Location: Keoladeo National Park, Bharatpur, Rajasthan
Camera: Canon EOS 5D Mark III, Lens: Canon 500 mm. f/4 IS,
Shutter speed: 1/1250 sec., Aperture: f/5.6, ISO: 640,
Focal length: 500 mm.
Image taken: February 20, 2015; 5:32 p.m.



Megh Roy Choudhury uses her talent in photography as a tool to document and create awareness about wildlife. As a teacher, she organises nature walks and awareness programmes for school children as well.

HUMBLING PRIVILEGE

What you see here is an extraordinary image of a magnificent wild red panda in its quintessential old-growth, Himalayan forest habitat. Most images of this very beautiful creature have been taken in one of many zoos. Not so this relaxed arboreal mammal, in flesh and blood. The duo of Megh Roy Choudhury and Prasanna A. V. wrote to say that after years of tramping through India's wildernesses, fate finally smiled upon them in the shape and form of their subject, resting high up on a moss-laden tree in the dense canopy of Singalila National Park, at an altitude of 2,700 m. Apart from climate change, such exquisite creatures must now also deal with the false ambitions of humans who are hell-bent on destroying these fragile slopes under dam reservoirs, roads and mines.

Location: Singalila National Park, West Bengal
Details: Canon 1Dx. Lens: Canon 600 mm. f/4, Shutter speed: 1/80 sec., Aperture: f/9, ISO: 1250, Focal length: 600 mm.
Image taken: April 30, 2015



A conservation photographer and creative artist, Mona Patel's work revolves around promoting and protecting the tiger and its habitat.

LEARNING THE ART

The tiger's hunting skills are unparalleled - skills bequeathed by a tigress to her cubs. Mona Patel has artfully framed the majestic Krishna (T 19), in the process of training her three cubs, against the picturesque landscape of Ranthambhore. Such images offer insight and knowledge into the complex world of felines helping us better understand them, aiding in their conservation.

Location: Ranthambhore Tiger Reserve, Rajasthan
Camera: Nikon D90, Lens: Nikon 55-300 mm, Shutter speed: 1/20 sec, Aperture: f/5, ISO: 1000, Focal length: 65 mm, Image taken: November 22, 2014; 5:42 p.m.





A software professional, Madhavi Joshi's love for wildlife got her hooked on to photography. She spends her free time visiting wilderness areas.

INVISIBLE CHASE

The sheer urgency in the flight of the deer forces you to search for the source of the panic that triggered this response. Look closer and you will discover stripes amidst the spots. The tiger has probably honed in on one particular target, though its charge has clearly infused the entire herd with terror. Madhavi Joshi writes that she had observed the young tigress waiting with zen-like patience in the Corbett Tiger Reserve, perfectly camouflaged against the green-brown grass... until she felt the moment was right and that is the moment you see here.

Location: Corbett Tiger Reserve, Uttarakhand
Camera: Nikon D7000, Lens: Sigma 150-500 mm. f/5-6.3, Shutter speed: 1/100 sec., Aperture: f/16, ISO: 400, Focal length: 150 mm.
Image taken: April 5, 2015; 9:05 a.m.





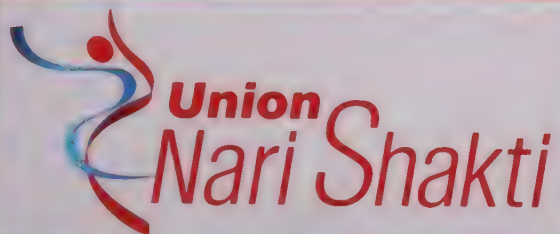
Computer engineer Rathika Ramasamy was drawn towards photography as a career in 2003 after a visit to the Bharatpur Bird Sanctuary. Since then, she has been passionate about birds and specialises in bird photography.

TURNING TABLES

No animal will take any kind of threat to their home lightly. None at all. And this pair of parakeets was no exception. The monitor lizard that tried to make a meal of their eggs learned the hard way that it should not underestimate a pair of agitated parents. Harassing and pecking with persistence, they eventually forced the lizard to scamper away. Rathika Ramasamy witnessed this mesmerising display of courage at the Keoladeo National Park in Bharatpur, Rajasthan and captured the moment that says it all.

Location: Keoladeo National Park, Bharatpur, Rajasthan
Camera: Nikon D4, Lens: Nikon 800 mm. + 1.2x TC, Shutter speed: 1/1250 sec., Aperture: f/8, ISO: 640, Focal length: 1000 mm.
Image taken: February 6, 2015; 5:42 p.m.

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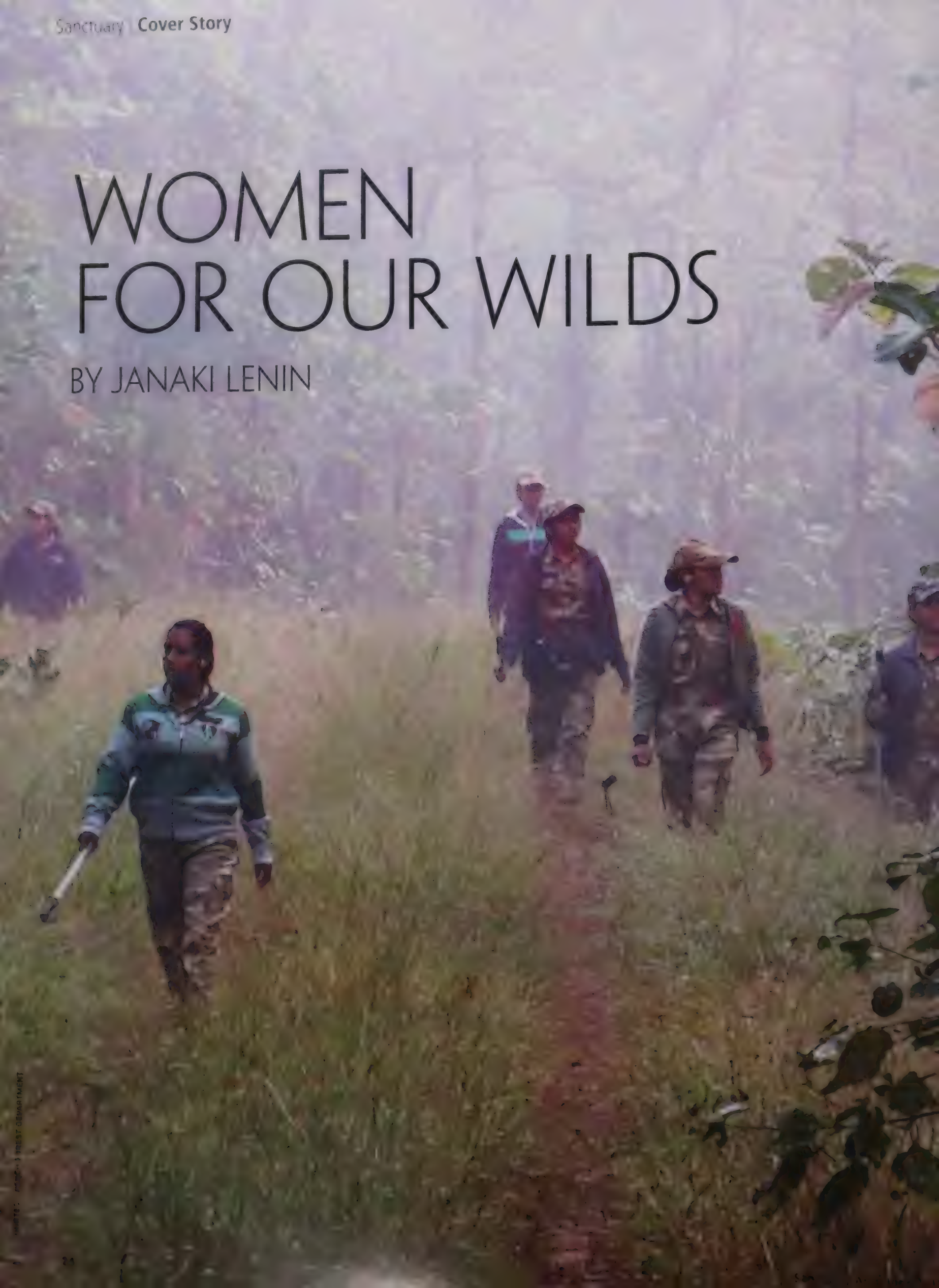


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WOMEN FOR OUR WILDS

BY JANAKI LENIN



J. Vijaya travelled to places such as Bhagalpur, Bihar, looking for turtles where even men feared to go. In 1981, she was only 22 years old when she began mapping areas where hunters had wiped out turtles, and to which rivers they had shifted their operations to feed the markets of Bengal. Her graphic black and white photographs shook readers of *India Today* magazine as well as Prime Minister Indira Gandhi's conscience (*Sanctuary* Vol. XXVI No. 2, April 2006).

In Kerala, she roughed it in a cave while studying the enigmatic cane turtle. Her only companions were *Kadar* tribals in a nearby settlement. One of India's most adventurous women field workers, she was a protégé of my husband, Rom Whitaker. Although I heard of her legendary exploits, she's relatively unknown outside of the little community of reptile aficionados.

I couldn't imagine how Viji overcame the rigours of living alone a dozen years before I stepped into a jungle. My first experiences of the forest weren't traumatic but I was uncomfortable. I had the luxury of being with an experienced naturalist, and I still feared everything from unpredictable beasts to misbehaving strangers. It took many months of learning about animals before I adjusted to life in the forest, and many more months before I learned to be a happy camper.

Viji was India's first woman herpetologist, but not the first woman field worker in India. There were other pioneers before her like Priya Davidar and Usha Lachungpa, both of whom studied birds in the late 1970s. "This was a time when there was little serious work being done in the field. There were not many men or women out there," says Rom.

BREAKING IN

Elsewhere, women were pushing frontiers, undertaking studies on the natural world. Sylvia Earle plunged underwater to study marine life, Jane Goodall brought new understanding of primate behaviour, and Rachel Carson turned the tide against the chemical

pesticides industry. Generations later, they would become global role models and icons for young people.

India's wildlife heroes then were Indira Gandhi and a wildlife-tolerant Rajasthani community called the *Bishnoi*. *Bishnoi* men allowed wild herbivores to eat their crops while their women went to the extent of suckling orphaned chinkara fawns. Both the Prime Minister and *Bishnoi* villagers are well-known to readers for their contributions and fostering of wildlife. But what part did ordinary women with neither the overwhelming political power nor the religious background play?

There were two strikes against women who wished to work in wildlife: society was old-fashioned, and wildlife research and conservation didn't figure among career options. To the average person, forests lay beyond the pale of civilisation.

Ghazala Shahabuddin, an ecologist, says of the 1980s, "My extended family and friends' view of wildlife conservation was, 'This can't be a job. You have to do something serious like medicine or administrative services.' It was considered a very unusual field for a woman."

Wildlife biology courses were offered only in a couple of institutions that accepted a handful of students a year. Ghazala travelled all the way from Delhi to Pondicherry to do her Masters. She says, "I come from a conservative Muslim family for whom the idea of women travelling and living alone was anathema. My mom was supportive but my dad was conservative and hated the idea of me going to Pondy for two years." The two-day train ride to Pondicherry was the first time Ghazala travelled alone, far from home. Her father refused to talk to her before she left. "I cried all the way to Bhopal."

Once Ghazala enrolled at the university, she says her father tried to coerce her to return by withholding funds for a semester. She was forced to borrow money from friends. She says, "This was the first time I had to rebel against my father. But ironically,

he was instrumental in creating my love for wildlife. When I was a child, we travelled to remote areas, on foot and by car. We visited many sanctuaries in India and abroad, and we had an early exposure to forests unlike other kids."

THE OTHER PROBLEM!

Getting consent from their families was only the first gauntlet. Women researchers faced challenges in the field. I thought decrepit staff quarters with primitive or no toilets, and the lack of basic comforts would figure prominently. I didn't hear a whimper of complaint on that score. Instead, some women had to confront a different predator in the jungles: men.

Lalitha Vijayan, former director of Sálím Ali Centre for Ornithology and Natural History, recounts, "At one time when I was working alone in the forest



FACING PAGE Women of the Special Tiger Protection Force on duty on a misty morning in the Pench Tiger Reserve, Maharashtra.

ABOVE Protecting nature is of foremost importance for the *Bishnoi* community of Rajasthan with their women going to the extent of suckling orphaned chinkara fawns.



India's first woman herpetologist J. Vijaya lived alone in a cave in Kerala for several months at a time while studying cane turtles, far from any help should anything have happened.

(in Thekkady), I was harassed by a gang of hooligans. I ran into the rangers' office. On another occasion, a rowdy-type of person cornered me in a gorge until I could not walk at all. The look on his face was horrible. I shouted out to my field assistant, "Raja, come with a knife," and the chap ran away. Animals are no problem at all. Even if elephants are there, we know how to deal with them. Once a male elephant ran after us, we gave him way and he went off. That wasn't as scary as human behaviour."

This is a problem even now. Prerna Singh Bindra, conservationist and writer (see page 80), says, "I have faced situations – and a few scary ones – where men have tried to take advantage of the fact that I was alone in a forest. But then I have faced that even in Mumbai or Delhi. It is intimidating at first, but as you grow older, you learn to deal with it. You fight back. There's no other option."

I expected harassment of women, who often work alone, to be par for the course, but surprisingly, it's not the norm. Ghazala, Vidya Athreya, and Arati Rao, who between them have worked in many parts of the country, have no tales of unwelcome attentions.

Insecurity may have been a major deterrent in the past. In recent years, more and more women biologists have entered the field, and they choose to do their fieldwork in remote locations

One camp I visited in Baratang, Andaman Islands, was so primitive that I wondered how swiftlet biologist Akshaya Mane lasted more than a day. She and her field assistants had to haul drinking water everyday from two kilometres down a steep, slippery slope.

Despite arduous field conditions, women biologists seem to be everywhere, studying elephants, lions, and birds and being voluble with their opinions. I could swear women biologists outnumber men.

However, Ajith Kumar, Director of the WCS-NCBS Masters in Wildlife Biology and Conservation programme, says women number less than half of the students. "Compared to other lab-based disciplines, there are far fewer girls in the course. I find that girls have been much more engaging with the public through print media." I expect this is the trend in other wildlife biology courses as well.

A CAREER FOR ALL?

Although there are a few women biologists from small towns, most of them come from urban centres. Why weren't women from more disadvantaged backgrounds willing to opt for a career in wildlife? Ghazala says, "My family was well-off so I was not too concerned about the uncertainty of a comfortable job or secure career. It helped that I had a family to fall back on, even if I didn't earn much."

Vidya agrees, "It has no career, no money, no assured job. For none of us is that important. We are a privileged bunch."

Some women from rural areas do enlist for fulltime fieldwork in the lower rungs of the forest service as guards and watchers. They confront armed poachers, conduct raids, and fight fires.

Gopa Pandey, one of the first Indian Forest Service women officers, says, "A woman of 28 to 35 years of age covers an area of 10 to 20 sq. km. all alone on foot. They have kids and they don't have support. Are they safe? We should not live in a fantasy or wrong notion that women can do anything. Rangers have to work 26 hours a day. They are actually super-men. Women range officers have to wear uniforms with belts even when they are pregnant. It's a big gang up against them."

Compared to these gutsy women, my occasional forays in the forest seem like child's play. Yet, women from other professions often ask me if I'm not scared to travel alone.

If I wasn't a filmmaker and a writer, and I wanted a job that was in close contact with wildlife, I would choose to be a naturalist in the tourism industry. I certainly can't withstand the rigours of higher education, and I would guess there

PUBLIC DOMIN



India's modern wildlife movement owes a lot to the legal and institutional framework that was created under former Prime Minister Indira Gandhi's leadership.

Despite arduous field conditions, women biologists seem to be everywhere, studying elephants, lions, and birds and being voluble with their opinions. I could swear women biologists outnumber men.

were many women who feel the same way. As a naturalist, you get paid to travel into parks and sanctuaries every day and see some amazing animal behaviour. But look around and you realise women naturalists are a rare species.

S. Karthikeyan, chief naturalist of Jungle Lodges and Resorts says, "I've trained only one woman in the past 12 years. She got married and quit. Guests drink in the evenings. Maybe women don't think tourism is a suitably safe occupation."

Motherhood is another stumbling block in women's ability to do fieldwork. Some women choose not to have children, or put their careers on hold until their children grow up. But others take it in their stride, like Kaberi Kar Gupta who carried her baby daughter to the forests of Kalakkad-Mundanthurai while she did her fieldwork. She says studying primates and watching their childcare influenced her decision.

Another primatologist Anindya Sinha and his wife Kakoli Mukhopadhyaya also carried their children to Bandipur. Anindya says, "People fuss over their children a great deal more than necessary. Kids are tough and resilient. Our children played with their toys in the rear of the jeep while we studied bonnet macaques. It taught them to be independent from a young age."

Arati Rao, a photojournalist (see page 12), says, "I know some women who are such good photographers, they could be professionals. They just won't do it. They say, 'But I have a child. You don't realise I need to be there when she comes home.' There is a burden of guilt we carry around and we really don't have to. I have a daughter too and my husband and I take turns. If you want something badly, you have to figure things out – what is important? What's your priority? There can be freedom but some women still remain shackled."

After overcoming all these obstacles in the field, life doesn't get any easier for women. Priya Davidar,

Professor at the Department of Ecology and Environmental Sciences, Pondicherry University, says, "I had no problem in carrying out field work, but working with my male colleagues was enormously challenging. I faced gender harassment – preventing women from carrying out research, interfering with their students, preventing women from participating in meetings, and so on. It happens to men as well, but less virulently because they are considered to be more powerful. It's very widespread among all fields of research and is a result of professional jealousy."

Such pettiness doesn't just afflict research, it also pervades other aspects of conservation. Gopa says, "We have to work twice the amount to get one-quarter the recognition that men get. They routinely look down upon us like we are small, we don't count. Most women officers have faced this over the years. It's very challenging; it's not for every woman. There's a whole army against you on the other side of the fence."

WOMEN LEADERS

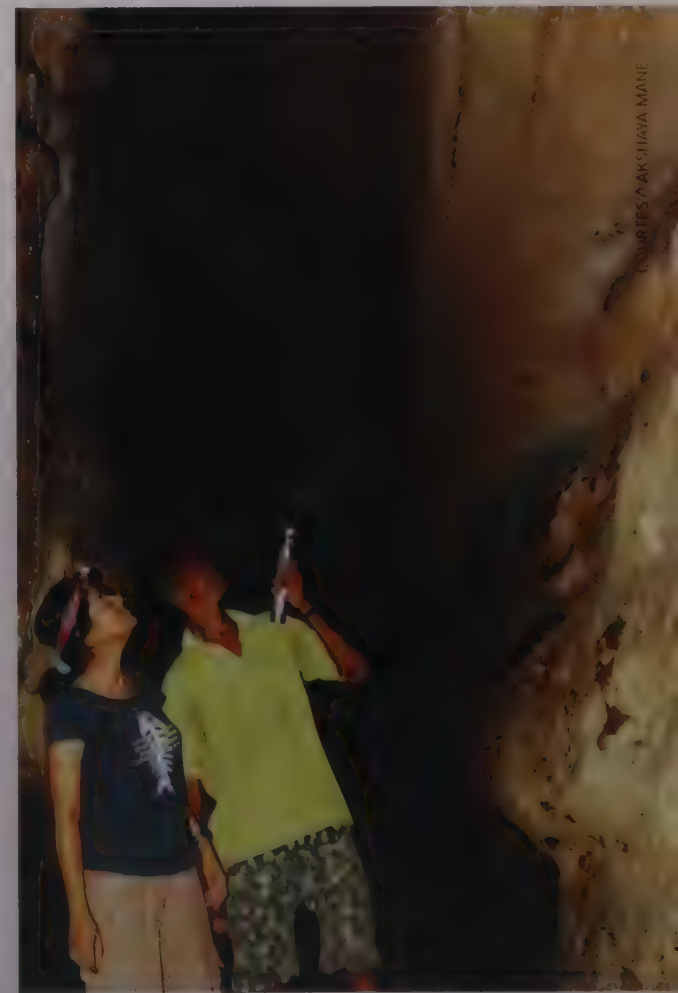
Prerna, who served in several committees such as the National Board for Wildlife (NBWL), says, "Most men find it hard to take women in a leadership role. I had to work that much harder to be taken seriously. There was this typical 'boys club' attitude, like 'How can this chit of a woman...' if you know what I mean. It could be petty – personal egos and jealousies – or the fact a woman was actually achieving something on her own merit. But it got daunting at times. There was a perceptible effort to pull me down when I took on the leadership role on some issues. But there are rare and wonderful exceptions when men appreciate and support you."

Few women hold leadership positions even in NGOs. The few that do, head organisations that they established like Zai Whitaker at Madras Crocodile Bank Trust and Belinda Wright of the Wildlife Protection

Society of India. One of the few exceptions is Sunita Narain of Centre for Science and Environment, who joined the organisation two years after it was set up by Anil Agarwal.

Ghazala says, "Whether it's a marketing job, wildlife job or teaching job, there is discrimination. If you work hard and have willpower, it's not that difficult. If you have support from close friends and siblings it makes it easier (to surmount the challenges)."

What if getting a job itself is a problem? Discrimination prevents women from getting jobs, tenure, and promotions. For instance, take a look at the composition of the editorial board of *Current Science*, one of India's premier peer-reviewed science publications. Eleven of the 12 members who handle ecology and conservation are men. All seven associate editors are men. In fact, there are only three women



Arduous field conditions haven't deterred women biologists such as Akshaya Mane from following their true passion.



Birute Galdikas, Jane Goodall and Dian Fossey, who studied orangutans, chimpanzees and gorillas respectively, under the aegis of anthropologist Louis Leakey, came to be known as 'The Trimates'.

in the entire 59-member board. Needless to say, the editor is also a man.

Science is not the only area where women are under-represented. Conservation policy and decision-making suffer the same malaise. Prerna says, "I realised that the 'glass ceiling' we hear about in the corporate world exists in this field as well. I found a paucity of women at decision-making levels. For instance, in many meetings in the MoEF or the Standing Committee (of the NBWL), I used to be the only woman."

In the forest service, Gopa Pandey says, "There are about 300 women out of 3,000 officers in the country."

Women who surmount all these challenges – braving the elements, gender harassment, and discrimination – become tougher cookies. Ghazala says, "When you get out of these struggles, you feel that much stronger and more empowered than a man would feel."

EMPATHY – A DIFFERENTIATOR

Others might then belittle women's successes, adding insult to injury. They assume that women who are successful must have had it easy. Vidya Athreya, who studied leopards in the farmlands of Maharashtra, says, "They said the Forest Department was nice

to me because I'm a woman. I saw men researchers who got along fine with the Forest Department too."

Prerna also faced similar comments. "Some said, 'She must be pals with the minister.' 'Officers will give you access because you are a woman' – I hear that often. I grant you that it might get you a meeting. But beyond that, it boils down to your work – your knowledge, research, conviction – and how you negotiate and convince them of the issue at hand."

Arati counters, "In terms of empathy, women can connect with women better, and see environmental, social, and health issues from a shared perspective. But I know men who are empathetic. On the other hand, I have heard of women photographers being insensitive."

Did being a woman not bring any advantages to the job? Did women work differently? Vidya says, "One word: empathy. As a woman, I'm empathetic to people who lost their kids to leopards. I'm a mother too. If you don't deal with people, you can't do anything for leopards."

Sonali Ghosh (see page 34), a forest officer who served in Kaziranga, Chakrashila, and Manas, says, "People were at ease with me, especially in Assam. They really open up. Forest guards chat and feel comfortable. Women are better at communication. I really feel this is where we excel compared to our male counterparts. Even within the department, lower rank officers are happy to have a woman boss because we stick to time, we are happy if you have done your work, and we are not into bureaucratic stuff. I've seen this across departments."

Priya says, "I think women have diluted this macho culture of self-aggrandisement and monopolisation of charismatic animals which is not healthy for wildlife research and conservation."

Could women feminise conservation? Was there something to the old eco-feminist argument about women being more closely connected to nature? But my husband is much more in tune with nature than I am.

I've been asked if being a woman influenced my writing. How could being a

DURGA SHAKTI

On December 4, 2014, as an audience of over 1,000 sat glued to their seats at the National Centre for Performing Arts, the women of Maharashtra's Special Tiger Protection Force marched onto the stage in perfect synchrony for a brief moment in the spotlight. Here, at the 15th Sanctuary Wildlife Awards they were honoured by the Chief Minister of Maharashtra with a Special Tiger Award.

Far from the glitz of the NCPA show, these women deal in the business of guts, grit and grime in the course of protecting the state's vulnerable tiger forests. Selected after a rigorous process that includes both physical endurance and aptitude tests, their skills have been whittled and polished to transform them into daunting protectors of the wild. In their olive-khaki uniforms, they patrol pathless miles in search of poachers and snares and spend their free time training in hand-to-hand combat with paramilitary comrades.

Committed and fearless, devoid of a few serial pooms, they are the embodiment of real power in the forest. In the power in the interest of tiger conservation, but the quality of inclusion in the conservation world.

The women didn't list the benefits of the forest as, "Firewood, fodder, and fruits." Instead, they displayed their astute understanding of ecology when they chanted, "Soil, water, and pure air; sustain the Earth and all she bears."

man, woman, transgender, or one of the other 50 plus gender identities recognised by Facebook for instance, influence one's research, writing, or photography? I thought it was a silly question.

GENDER AND CLASS

Shekar Dattatri, a wildlife filmmaker and conservationist says, "Gender bias may have kept some women away from fieldwork in the past, but I don't think gender has anything to do with their impact on conservation."

Arati says looking at one's work through a gender perspective "seems to undercut intelligence, undercut merit."

I could see where Arati was coming from. To prefix 'woman' to one's career seems to put one in a sub-category. I want to be judged as a journalist, not as a woman-journalist.

Maybe Arati and I are speaking from positions of privilege. Protecting forests for a pay cheque isn't the only way women turn conservationists. Across India, thousands of women, often illiterate, safeguard forests and wildlife as a way of life and securing their livelihoods. They struggle against class, caste, state, and private companies, while having to live within a patriarchal society.

The most famous environmental movement was Chipko. In 1973, women of a remote Garhwal village, Mandal, in the Himalaya, saved 300 trees from being hacked down by a timber contractor. Villagers' appeal to cut 10 trees to make agricultural implements was turned down, but the contractor was allowed to cut trees for a manufacturer of tennis rackets.

The men of the village were away when loggers arrived. Village women hugged the trees and dared the men to cut them down as well. The unnerved contractor backed off. This was one of the flashpoints in the villagers' struggle to wrest forest resources from the state. Similar movements to save forests sprouted not only in nearby villages but as far away as Karnataka where it took the name Appiko.

Poor women are victims of environmental degradation, and it is said that their desperate circumstances make them take radical actions. Environmentalism of the poor, Anil Agarwal famously called it. But the women of Mandal didn't materialistically list the benefits of the forest as, "Firewood, fodder, and fruits." Instead, they displayed their astute understanding of ecology when they chanted, "Soil, water, and pure air; sustain the Earth and all she bears."

Thousands of villagers, many *adivasis*, manage community forests in central India, like the *Dhongria Kondh* of the Niyamgiri Hills. They decide which forest produce to harvest, who can harvest, and when.

Kalpavriksh documented the case of a 30-household-village of *Kondh* tribals called Dangejheri, Nayagarh district, Odisha. In the 1970s, industrialisation had completely denuded the area. Villagers nurtured the barren hills back to life. When the timber mafia moved in and the Forest Department failed to aid the residents, women, armed with sharp implements, confiscated the illegally-harvested timber. Since then they formed the Maa Ghodadei Mahila

Samiti to manage their 80-hectare community forest. Women's confidence surged with their success. Now they are an inspiration for women of neighbouring villages.

Hundreds of *van panchayats* across Uttarakhand, with the active participation of women, are similarly committed to nurturing forests. Rural women also joined in mass protests against mining, dams and other forest-destructive industries.

Perhaps the impact of gender seems inconsequential in research, policy, and the humanities, but it's a big factor in governance. Economist Bina Agarwal studied the management of community forests in Gujarat and Nepal. In her book *Gender and Green Governance*, she writes that when more women are involved, they are able to enforce strict conservation rules and impose harsher penalties. She argues that forests protected by all-women groups are in better condition than others.

Women in research and conservation have to reach a critical threshold before we realise the impact of gender. To achieve that, we need more plucky women like these to tread the wild path. 🐾



In the 1970s, the Chipko movement (see page 96), saw villagers, especially women, stand up against commercial logging operations that threatened their livelihoods.

CET/PUBLIC DOMAIN

BELINDA WRIGHT



"Much of my childhood was spent in the jungles of eastern India and I soon knew exactly what I wanted to do with my life – work with India's wildlife. Too headstrong to realise the value of higher education, I decided to make wild places my learning curve and took to wildlife photography, with the constant refrain, "This is not a career," ringing in my ears. But what a wonderful era it was to explore India. Still in my teens, I travelled everywhere – hundreds of dusty, difficult kilometres through the country at a time when there were not even gates at most of the national parks and sanctuaries. And then I struck gold. At the age of 20, I got a job with *National Geographic* magazine to join a team photographing India's wildlife: I was their only woman photographer, and their youngest.

From there, my partner and I went on to make wildlife films, 13 of them, and to write books, five of them. My most magical memories are of the two years we spent in the 1980s filming wild tigers in Kanha and Ranthambhore for National Geographic's *Land of the Tiger*. We won two Emmys and 14 other international awards and the film became the second-highest rated show in the history of U.S. public television.

Life as I knew it came to an abrupt halt in 1994. A few tigers I knew well suddenly went missing around Kanha, where I was living. The tribals said people from outside had come and were killing them, and then a man in a PCO booth in a small town called Baihar offered me four fresh tiger skins. That was the defining moment of my life. In a split second I went from a relatively shy wildlife photographer to a possessed hunter of tiger killers. With the help of local police,

the gang was arrested, the skins seized and a huge tiger-poaching racket uncovered.

That summer of 1994, I travelled with a friend through 13 districts in Madhya Pradesh. In six weeks we were offered the skins and bones of 39 freshly-killed tigers. We prepared a report that stunned both the government and the conservation community.

Later that year I established the Wildlife Protection Society of India (WPSI). Our primary aim was, and still is, to provide support and information to enforcement authorities to curb poaching and the illegal wildlife trade. For 20 years, my colleagues and I have pioneered investigations into this grisly trade, in India, Nepal and China. Since 1994 we have had the unenviable chore of 'documenting' 1,047 tiger poaching cases and a staggering 4,143 leopard poaching cases.

Fortunately I have always had somewhere to escape to – to 'smell the roses' and keep my senses. In 1979, my father bought some agricultural land on the edge of Kanha National Park. Two years later he

BLAZING TRAILS

started what was probably the first private wildlife camp in the country. Kipling Camp is the beating heart of my family, and I inherited the camp with my mother when my father passed away in 2005.

The farmland is now thick jungle. I can lie in bed and hear chital munching just outside the window, and the occasional tiger or leopard padding by, claiming their rights at nightfall when we are safely tucked up in bed. I now wear two hats – one as an unflinching wildlife conservationist, and the other as a cautious wildlife camp owner. The combination is not nearly as difficult as I thought it would be.

We are all born with endless potential, but it is what we do with this and the choices we make, that mould our destiny. If I had to offer advice to the next generation of conservationists, I would say commit to your dreams fearlessly, and avoid ulterior motives and big egos. This is a huge and often heartbreaking task that requires discipline, hard work, knowledge, commitment and responsibility. But it is also a life with heart-warming rewards and sunny days, so whatever happens, do not forget to smile along the way. For that will be your most powerful tool of all.

Executive Director of the Wildlife Protection Society of India, wildlife photographer, Emmy-award winner and eco-lodge owner, Belinda Wright has been spearheading India's fight against wildlife crime for over two decades.

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It was late afternoon and the tiger was calling repeatedly. We sat behind a *sal* tree near where my guide Imam predicted it would come out. And within a few minutes, it did. Only 20 m. from us, it turned to walk in our direction. I was holding my breath. It was then that the other guide got scared and coughed loudly. The tiger took one startled look at us and vanished with a leap. I was disappointed at this sudden ending to a magical moment in this lovely forest in Lansdowne division, Uttarakhand, but I was thankful too.

We are in a biodiversity crisis. Yet, India remains a mega-diversity country where significant populations of large, and often dangerous, wildlife species survive. There exists a remarkable tolerance among our rural communities towards wild animals, despite the danger

WILD SHADES OF GREY

to property and even to their own lives that they often face from wildlife. This is due to a remarkable spirit of co-existence.

Yet, our national focus remains on Protected Areas as the only viable strongholds for wildlife. They are necessary, but we must try to understand better to what extent it is possible for wildlife to persist alongside local communities in our wild spaces, and be willing to experiment with alternate conservation models.

"Doing" conservation today is often about managing conflict – this has conventionally been



depicted as parks vs. people or wildlife vs. people. But it really is people vs. people. These conflicts arise from different needs, world-views, approaches and interest groups.

How to reconcile this conflict to ensure nature conservation is the biggest challenge we face. I have often battled with many dilemmas. For me, the real world of conservation is full of shades of grey. I have learnt that reconciliation is sometimes not possible given the rigidity of approaches to how conservation must be done. However, I believe that conservation must be fair, equitable and morally defensible. Coercive, top-down conservation efforts may achieve goals over the short-term, but often backfire over the longer term. We must be sensitive to the human dimensions of conservation, often affecting the more marginalised. Conserving nature should be as much about winning hearts and minds, and about conserving people's relationships with nature.

Dr. Aparajita Datta is a scientist with the Nature Conservation Foundation. Since 1995, she has been involved in research and conservation in Arunachal Pradesh with a primary focus on hornbills. Her main interests include plant-animal interaction in rainforests, understanding anthropogenic effects on wildlife, and engaging with tribal communities for conservation.



Lakshmy Raman speaks with two women trail blazers from the Indian Forest Service, **Sonali Ghosh** and **Neha Verma**, about their careers, motivation to make a difference from within the system and the role women can and do play in wildlife conservation.

Meet Sonali Ghosh

Born into a family of Army personnel, Sonali Ghosh knew from an early age that she wished to be involved in forest and wildlife conservation. A topper of the Indian Forest Service batch of 2000-2003, she is armed with a slew of degrees including post-graduate degrees in forestry and wildlife science, a post-graduate diploma in Environmental Law from the National Law School of India, and another one in systems management. She has also won

a doctorate in remote-sensing technology concerning habitat suitability for tigers in the Indo-Bhutan Manas landscape.

WHERE DID YOUR LOVE FOR WILDLIFE SPRING FROM?

My army background and time spent outdoors subconsciously instilled a love for nature. The real initiation came during my MSc. days at the Wildlife Institute of India, where the rigorous field-based education and training left a long-lasting impression.

AND YOUR GREATEST INFLUENCES?

There is no one single person but rather various teachers, colleagues and yet others I met during training periods at

some of our country's best institutions. Living and studying abroad, especially in the United Kingdom also shaped my thinking.

HOW DID THIS TURN INTO A CAREER IN SCIENCE AND CONSERVATION? DID YOU FACE ANY HURDLES?

As they say, chance favours the trained mind. I was quick to appreciate the forests and wildlife of Assam, the state I was allotted after my selection in the forest service. Because of my university and academy training, I was already 'toughened' and the rough period in the initial years (as an Assistant Conservator of Forests, with limited facilities in remote areas) was compensated by postings in stunning forests such as Kaziranga. In a way, I was confident with what I was dealing with. The only

hurdle I would say was a wrong personal decision that set me back by a period of three years as I became indecisive about the way I wanted my life to be.

YOU WERE FIRST POSTED AS AN ASSISTANT CONSERVATOR OF FORESTS IN THE ASSAM STATE ZOO DIVISION AND KAZIRANGA NATIONAL PARK? WHAT WERE YOUR LEARNINGS?

Team work and institution building is important and the Kaziranga model is a benchmark for wildlife conservation in India. The forest frontline staff is key to protection and management of Protected Areas, and a good management policy would be to invest in their capacity building and well-being. The Assam State Zoo is one of the 'greenest' zoos in the country with the second-highest footfall in the state (after Kaziranga). Zoos can be important centres for learning and wildlife conservation and must be solely managed for that purpose.

YOU WERE THEN MOVED TO THE DEPARTMENT OF FINANCE (TAXATION). WAS THIS A WASTE OF YOUR EXPERIENCE AND EDUCATION?

I did feel lost and wasted when I was transferred to the Sales Tax department. On the positive front, I gained governance experience from one of the most efficient departments in the state.

YOUR TWO-YEAR POSTING IN THE SOCIAL FORESTRY DIVISION SAW YOU IN KOKRAJHAR. IS THERE HOPE FOR THE GOLDEN LANGUR THERE AND WHAT ARE ITS GREATEST THREATS?

As DFO Social Forestry, Kokrajhar, I managed a small wildlife sanctuary called Chakrashila that was designated in 1994 as a Protected Area in recognition of the community protection of golden langurs. The endemic primate has survived in a tribal-dominated area because of traditional and religious beliefs. The erosion of such traditional knowledge is a big threat and so are large-scale developments such as construction of highways. Since large tracts of forests are still available on the northern side (contiguous with Bhutan), golden langurs here are presently safe. There is, however, a need to regularly monitor

the populations and take up a holistic project on their conservation and management status.

MANAS WAS MAKING A STRONG REVIVAL BUT A RETINUE OF THREATS INCLUDING POACHING CONTINUE TO AFFECT THIS PARK. YOU ALSO HAD A STINT AS THE CONSERVATOR OF FORESTS AND AS DEPUTY DIRECTOR IN MANAS NATIONAL PARK. WHAT DOES THE FUTURE HOLD FOR MANAS?

It has been about 10 years since the formal revival process for Manas was taken up by the local government. To achieve success in rhino reintroduction, revival of other species (tiger, swamp deer) and involvement of multiple stakeholders (communities for conservation, NGOs for scientific monitoring of species) is no mean feat. There are glitches in its armoury, but let's give it more time. The sheer strength of Manas is its large area and landscape that is able to act as a shock absorber for any unnatural event such as poaching. We need to secure its buffer areas and keep its boundaries intact.

YOU WERE INVOLVED IN THE FIRST SUCCESSFUL REHABILITATION OF CAPTIVE-BRED CLOUDED LEOPARD CUBS IN THE WILD. DO YOU THINK

INDIA'S CAPTIVE BREEDING AND RELEASE EFFORTS ARE WORLD CLASS? India's captive breeding needs a complete revamp. I feel the main objective of zoos should be only of conservation education. *Ex-situ* breeding therefore needs a rethink on what we are trying to achieve. In the case of the clouded leopard, the biggest challenge was that nothing was known about rearing them in captivity. It was mostly trial and error, although this time we were lucky, as it was backed by wildlife science (availability of experienced animal keepers and vets). I think every wild animal that is rescued must be given a chance of rehabilitation in the wild. The veterinary wing of the Forest Department needs a complete revival with the right mix of equipment, technology, manpower and expertise to support rescue and rehabilitation cases. This should now be recognised as an integral part of wildlife management, and rules and protocols also need to be developed accordingly.

WOULD YOU CALL YOURSELF A PRAGMATIC WILDLIFER?

Lakshmy, if by pragmatic, you mean being a practical wildlifer/administrator, I would say yes. I have never stopped learning and I feel it is very important for every career person to undertake a higher education later in their life. The government encourages its employees



ABOVE "Seasoned patrollers always point their rifles downwards," Dr. A.J.T. Johnsingh told Sonali after this image was taken at Manas.

FACING PAGE A self-portrait at Bura-Buri camp, Manas, with wild elephants in the background.

DR. A.J.T. JOHNSINGH



After a hard day's work: Sonali Ghosh with her rhino monitoring teams at Kuribee camp, Manas.

to take study leave, however, one must opt for an education entirely out of passion and not merely to obtain a degree. I opted for wildlife postings in Assam because I knew that I could make a difference, even if it was small. Wildlife postings are generally not sought after because of the tough working conditions, so in a way I can say that I planned and worked my way towards being 'practical' and opting for those areas which I was comfortable with due to my prior education and experience.

DO YOU THINK THE WILDLIFE INSTITUTE OF INDIA (WII) SERVES ITS PURPOSE OF CREATING A FORMIDABLE FORCE OF SCIENTISTS AND FIELD BIOLOGISTS?

Most certainly, from stalwarts such as Dr. A.J.T. Johnsingh, H. S. Panwar, the younger generations of 'tiger' researchers to the alumni of diploma and certificate trainees, one out of 10 conservationists in India would perhaps find a link to the WII.

ARE MOST RESEARCHERS DISCONNECTED WITH CONSERVATION ON THE GROUND?

It would be incorrect to say disconnected. They must surely arm themselves to better appreciate the multiple complexity of being a forest/PA manager. Researchers are usually specialists and focus on a target species or taxa, so they find it distressing if the forest manager is not paying attention to their area of interest. There is also a thin line

between undertaking conservation research and advocacy that needs to be clearly spelt out and researchers must be educated and trained in defining this by their respective institutions. Finally, there is a need to make science more reachable to the general public, forest frontline staff and policy makers for greater acceptability.

GIVEN THE CURRENT STATE OF EDUCATION IN OUR COUNTRY, DO YOU THINK YOUNG WOMEN WILL BE MOTIVATED TO CHOOSE A CAREER IN FOREST AND WILDLIFE CONSERVATION? ARE THERE ENOUGH OPTIONS?

It has certainly improved with wider choices and a change in people's lifestyle where children are exposed to holiday trips to parks and sanctuaries at an early age. However, most youth are likely to take this up as a hobby rather than a profession. The only motivation will be to improve the remunerations (as recently done with the UGC norms for JRFs and SRFs) and also popularising it as a subject at the high school and under graduate level. There could also be a special consideration for wildlife as a subject in competitive exams such as the Indian Forest Service.

DO YOU SEE YOURSELF AS PART OF THE BATTLE TO PROTECT INDIA'S WILDLIFE?

Certainly yes. I am proud to be in this field and am grateful for the opportunity I have been given to live and work from within the system.

HAVE YOU WORKED WITH OTHER WOMEN OFFICERS IN THE FOREST DEPARTMENT? WHAT DO YOU THINK ARE THE GREATEST CHALLENGES FOR WOMEN?

When I joined the service (in 2000) there were less than 100 women IFS officers. They are surely in greater number now. The biggest challenge in the initial years is the compromise one must make to balance work and family, especially being a mother and tending to kids. Although, with the right facilities (medical and school), I think the forest is the best place to raise a child. Forest frontline staff (especially the Ranger and Deputy Ranger level) has seen a lot of women entrants in recent years. They are young, fit and enthusiastic. As long as there are basic facilities (such as a private bath, toilet) and sometimes a school/crèche to take care of children (below five years) they are equally at par and sometimes better than their male counterparts. They make excellent communicators and hence are an asset for data documentation and for local community interface.

YOU HAVE NOW MOVED BACK FROM THE FIELD TO ACADEMIA AS A SCIENTIST WITH THE WILDLIFE INSTITUTE OF INDIA. WHAT PROMPTED THE MOVE AND DO YOU MISS BEING IN THE FIELD?

After serving for 15 years (out of which 13 were spent in the field) it was a natural career progression to come on deputation to the WII. I am confident that I can now make a difference at the policy level and the institute gives me the right platform to do so. There are moments when you miss the day to day 'fire-fighting action' in the field, but here I have a larger canvass and it is now up to me as to how I continue to fill it up.

WHERE DO YOU SEE YOURSELF 10 YEARS FROM NOW?

I most certainly see myself continuing to work for wildlife and forests... perhaps living in one too!

WHAT WOULD YOUR MESSAGE BE TO YOUNG WOMEN INTERESTED IN WILDLIFE CONSERVATION CAREERS?

Just follow your heart and systematically work towards your goal. Passion is required in any profession and it is even more so in the field of wildlife. 🐾



COURTESY: NEHA VERMA

Meet Neha Verma

As an IFS officer serving in Uttarakhand, Neha Verma is a committed wildlifer who has taken on the challenges of conservation and management of wildlife and forests. With her atypical engineering background (BTech in Chemical Engineering from IIT Kanpur and corporate experience in software development) she is a rarity in the field of wildlife conservation. Trained in the use of RS-GIS technology and its application as well as wildlife population estimation tools, she combines technical, organisational and management skills with her passion for wildlife.

WHAT TRIGGERED YOUR LOVE FOR WILDLIFE?

Since childhood I have been keenly interested in trekking and other outdoor activities. But it was my long stay at the Corbett Tiger Reserve during my college days that spurred my love for wildlife. It's where I was formally introduced to birding and wildlife and issues related to its conservation by Amit Verma, who is now my husband.

SOFTWARE DEVELOPMENT TO WILDLIFE CONSERVATION? WHY THIS TURNAROUND?

After graduating from IITs, Amit and I took up software jobs. Subsequently, a passion for wildlife and a penchant for the outdoor life and adventures led us to explore the natural world extensively. The consequent exposure to issues and challenges made us restless in our mundane, cubicle jobs and propelled us to find a way to contribute actively and significantly, rather than being mute spectators to the constant loss of wildlife and forests. After much deliberation and discussion,

some with friends in the service and wildlife sectors, we finally decided to be part of the system. The kind of impact one can make from the inside can't be matched by just financial contributions or through non-governmental work. We quit our software jobs in 2003 and returned to India, appeared for the Indian Forest Service exams and made the plunge together.

DID YOU FACE ANY HURDLES?

The rigid, hierarchical bureaucratic set up of a government job was in huge contrast with the open corporate culture we were used to. It took a while for it to sink in. And there were, and are, hurdles while working in the system in a non-conformist way.

WHAT WAS YOUR EXPERIENCE AS THE DEPUTY DIRECTOR OF THE UTTARAKHAND FORESTRY TRAINING ACADEMY (UFTA)?

I was in-charge of training the frontline staff of the Forest Department to ensure that they are ready to face the numerous challenges of protection in the field. The trainees undergo a mix of classroom sessions, field activities and exposure visits to hone their skills. Along with traditional forestry practices, they are also exposed to use of technology like GPS, RS-GIS and camera traps. A lot of stress is laid on their physical fitness through daily exercise routines, trekking, sports and swimming. Since these forest guards, foresters and rangers are the ones who work at the grassroot level, UFTA plays a very significant role in strengthening the foundation of forestry in India.

YOU ARE CURRENTLY INVOLVED IN THE WORKING PLAN OF THE TERAI FOREST DIVISION...

The Terai East Forest Division is a part of the vast Terai Arc Landscape and comprises an area of 800 sq. km. of terai and *bhabar* tracts between the Gola and Sharada rivers. This division has some very good forest areas including large patches of *sal*, sheesham and mixed species. It also connects the Nandhaur Wildlife Sanctuary with the Pilibhit Tiger Reserve through the Kilpura-Khatima-Surai corridor. The area is home to elephants, leopards, tigers, bears, hyenas and crocodiles. High human population density and

dependency on forests, large-scale encroachment, hunting pressure, large scale diversion of land for development are some of the major challenges in this area.

YOU ARE PLAYING A KEY ROLE IN THE PROTECTION OF THE LANSDOWNE FOREST DIVISION AS A BUFFER TO CORBETT AND RAJAJI.

The Lansdowne Forest Division, covering an area of 433.27 sq. km., occupies a very significant position in the Terai Arc Landscape. It is sandwiched between the Rajaji Tiger Reserve (RTR) on the west and the Corbett Tiger Reserve (CTR) on the east and provides crucial connectivity between these two major tiger habitats. This Rajaji-Corbett corridor is essential for maintaining the viability of the tiger population across the landscape as has been proven by recovery of tigers in RTR due to dispersal of individuals from CTR facilitated by this corridor after the relocation of *Gujjars* from RTR. It is also vital for genetic exchange in mega fauna across the landscape and thus the maintenance of genetically diverse and healthy populations. In addition, this division supports a very significant source population of tigers. It is a recognised elephant corridor and is part of the Shiwalik Elephant Reserve with one of the highest densities of elephants in the entire state. Leopards, Himalayan black bears, sloth bears, otters, hyenas, honey badgers, martens, leopard cats, pangolins and porcupines are among other noted species found here. This area is also extremely rich in avifauna and has high diversity and abundance of fish.

I had been working to obtain Buffer Tiger Reserve status for this forest. The honourable Chief Minister of Uttarakhand has already made a declaration to the effect though it has not yet received an official approval.

YOU HAVE WORKED ON SEVERAL PROJECTS ON HUMAN-ANIMAL CONFLICT FROM LEOPARDS, ELEPHANTS AND BEARS TO WILD UNGULATES IN UTTARAKHAND. ARE WE DOING ENOUGH TO REDUCE CONFLICT ACROSS THE COUNTRY?

Human-animal conflict is very severe in Uttarakhand and is one of the greatest hurdles to wildlife conservation. Be it



NEHA VERMA

A talented artist, in her free time Neha renders stunning charcoal portraits of large mammals or watercolour paintings of birds.

human injury, death or cattle lifting due to leopards, mauling cases by bears, crop raids by macaques, wild pigs and ungulates or severe crop depredation, loss of property and life by elephants, this conflict has turned ugly. One case of human death or injury washes out all the efforts of conservation in the area. We can't talk about saving wildlife to people whose lives or livelihoods are destroyed by the same wildlife.

I must admit that we have not been able to make a significant dent on it despite efforts by the department in this direction. The task that is being undertaken with highest priority is the distribution of compensation for loss of life or property due to conflict. Timely compensation helps to alleviate anger and frustration but what we are doing is adapting to conflict, rather than mitigating it.

To address this issue, we need to go to the root of the problem. We have to identify the exact driving factors of conflict and address those with utmost urgency. And each problem-causing species has to be dealt with individually. It is time to start working seriously on site specific and animal specific solutions if we wish to take care of this problem.

And for this we need to have much stronger connect between research inputs and management implementations.

YOUR WORK ON THE UTTARAKHAND MACAQUE HAS BEEN OUTSTANDING. TELL US MORE.

It was in 2006 while undergoing IFS training at Indira Gandhi National Forest Academy (IGNFA), Dehradun, that Amit and I got a chance to explore and photograph an apparently unreported species of macaque noticed earlier by the Chief Wildlife Warden. The job at hand was exactly what we loved to do and we set out to locate the macaque in the remote areas of Gori valley in Pithoragarh district, in order to observe their behaviour, photograph them and talk to locals to gather more information.

We made several visits to this area and spent countless hours studying the macaques and prepared detailed notes on their morphology, behaviour and habitat. Since they are hill macaques and are found on the cliffs, it was indeed challenging to locate and then follow them. We also collected faecal and blood samples for their genetic study to establish their taxonomic position.

To tell you in brief about the results, morphologically these macaques closely resemble the pelops sub-species of the Assamese macaque *Macaca assamensis pelop*. Genetic studies have until now classified them as an 'Ecologically Significant Unit'.

DO YOU SEE YOURSELF AS PART OF THE BATTLE TO PROTECT INDIA'S WILDLIFE?

Protection of wildlife is not a one-time job. It is a continuous and long-drawn effort. And it is like wading against the tide where all odds are against you. I often quote Bittu's statement, "All our victories are ephemeral and defeats eternal". This is because there is a strong pro-development bent of the political class, bureaucracy and people in general. Wildlife and forests are suffering most due to this short sightedness. Sustainability is always overlooked in important decision-making. Also, wildlife and forest conservation is not a task which can be accomplished by a handful of like-minded people. Until we have a mass movement, a strong wave sweeping across the society to save our

natural resources and natural heritage for our own better future, we will always be fighting a losing battle. The sensitivity needs to be cultivated in all sections of the society – a task easier said than done. Nevertheless, it is important to play one's part selflessly and hope for the best.

GIVEN THE CURRENT STATE OF EDUCATION IN OUR COUNTRY, DO YOU THINK YOUNG WOMEN WILL BE MOTIVATED TO CHOOSE A CAREER IN FOREST AND WILDLIFE CONSERVATION?

Definitely! I now see many universities offering B.Sc. degrees in Forestry or Wildlife Sciences. And more and more women are now joining our Forest Departments at different levels. There is 30 per cent reservation for women in the Uttarakhand Forest Department, right from forest guards onwards. Also, there are lots of young girls taking up wildlife research as a career and quite a few of them are working in the field doing camera trapping, sampling for wildlife, social surveys and more.

We were seven lady IFS officers in the batch of 30. Just as a greater percentage of women are joining the IFS, we see a greater induction of women at the level of frontline staff as well. Not only this, a visit to WII and other research institutes will definitely corroborate the fact that more women are now taking up wildlife research.

WHAT DO YOU THINK ARE THE GREATEST CHALLENGES FOR WOMEN IN THE FOREST DEPARTMENT?

This job is demanding owing to the remoteness of areas and the very nature of the job, but it is still quite a smooth sail for women IFS officers as compared to women frontline staff. I would admit that working conditions are definitely tougher for women frontline staff, not because they are not tough enough to handle them, but because the Forest Department is not yet prepared to embrace their issues.

The greatest challenge I believe is to open the limited mindset of people to provide us the opportunities to fully explore our potential. Also, since territorial jobs are very demanding with 24x7 responsibility of protection of forest and wildlife, balancing work with personal life becomes a challenge.

TELL US ABOUT YOUR FAMILY
YOUR HUSBAND, AMIT, IS ALSO A KEEN WILDLIFE

Amit is an avid birder and excellent bird photographer. He is also a PADI certified scuba diver. He is savvy and deeply interested in remote-controlled flying. These days he is experimenting with applications of drones in wildlife solutions.

Amit and I embarked on our journey from the IT industry in the U.S. to wildlife conservation in India together. We were fortunate enough to get selected for the IFS in the same batch. Since then he has made some outstanding contributions to the field of conservation while serving the Haldwani Forest Division and Kalagarh Tiger Reserve and has played a pivotal role in the declaration of the Nandhaur Wildlife Sanctuary.

Our six-year-old daughter Tisha is also keenly picking up birdwatching and loves going to the forests. Recently there has been a new addition in our family with the arrival of our son, Tanish.

YOU ARE ALSO A CERTIFIED SCUBA DIVER.

I learnt scuba diving in Florida. For me, there is no activity more fascinating, exciting and enthralling than scuba diving. The underwater world is far more diverse and beautiful than the world above. Unfortunately, I couldn't continue diving

after my return from the U.S. as I am located in Uttarakhand

WHAT DO YOU DO IN YOUR FREE TIME?

I love painting wildlife. I mostly paint birds in watercolours and large mammals in charcoals.

WHERE DO YOU SEE YOURSELF 10 YEARS FROM NOW?

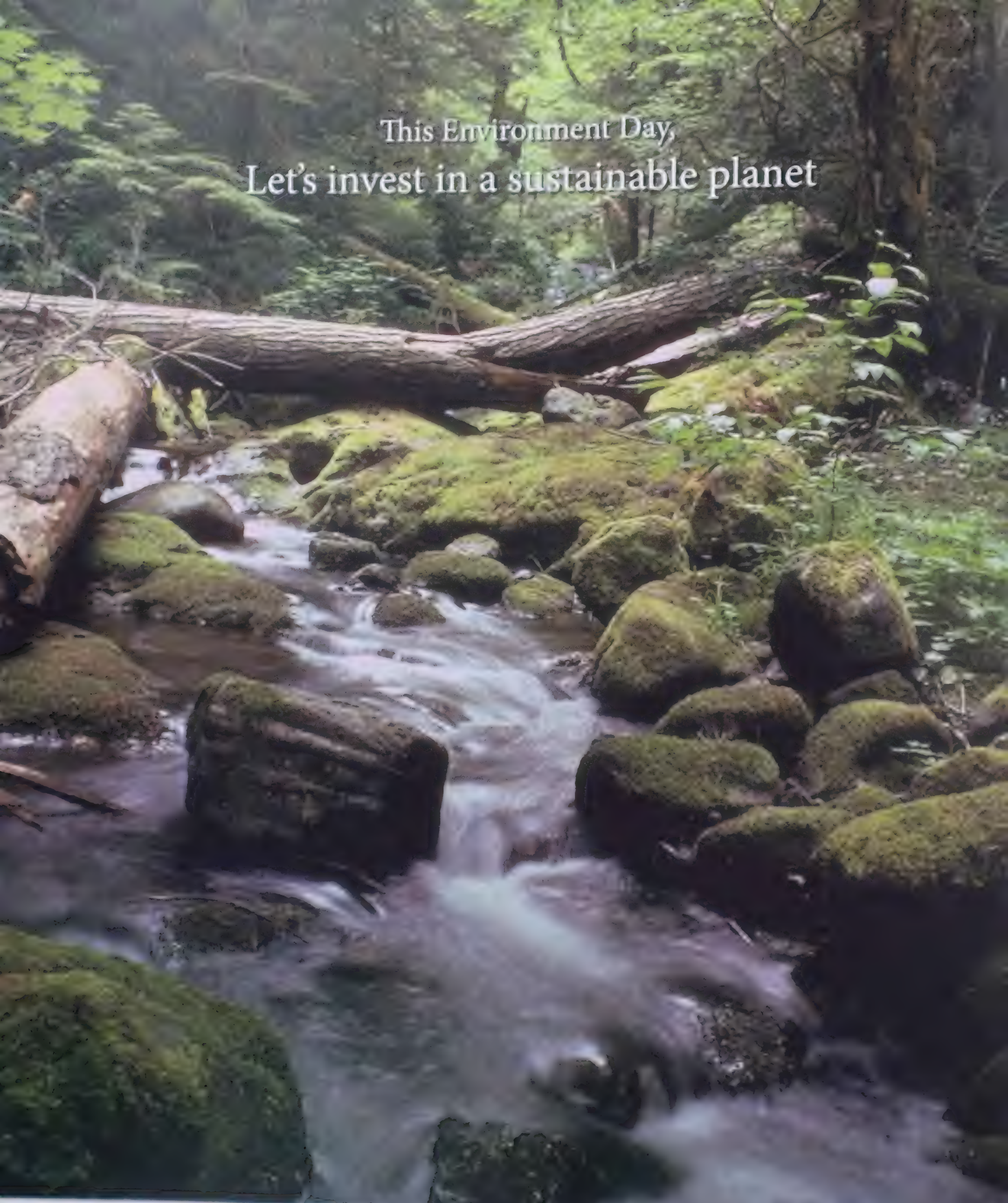
I have realised that though ground work is important for wildlife conservation, it is the right decision-making at the top levels which is crucial for the success of any conservation effort and can have far-reaching consequences. So I guess, given favourable circumstances, 10 years from now, I see myself contributing significantly towards formulation of policies for wildlife and forest conservation.

WHAT WOULD YOUR MESSAGE BE TO YOUNG WOMEN INTERESTED IN WILDLIFE CONSERVATION CAREERS? If love for nature and wildlife is what drives you in life, let it take charge! Wildlife conservation needs a huge brigade of keen workers. And there are various career paths one can choose from government jobs in the IFS/PFS/frontline staff to research, NGOs, journalism, legal activism, awareness generation, education and even commercial ventures like sensitive eco-tourism. 🐼



Neha, along with husband Amit, spent months studying the Uttarakhand macaque, which was till then an unreported species.

AMIT VERMA

A photograph of a small, clear stream flowing over large, moss-covered rocks in a dense forest. The water is slightly blurred, suggesting movement. The surrounding trees and foliage are vibrant green, creating a serene and natural environment.

This Environment Day,
Let's invest in a sustainable planet



WITH YOU, RIGHT THROUGH

HDFC House, 177 Park Road, 19th-20th, Sakinaka, Bandra
Chungate, Mumbai 400 020. Tel: 800-000 2200/2201

DR. VIDYA ATHREYA



more than half of the global tiger and Asian elephant populations, and the only population of the Asiatic lion. A significant part of the elephant and lion ranges incorporate human-use landscapes. It is a tribute to our rural and tribal people who have the space in their hearts to share their physical space with wild animals. If not for them, we would be like most other countries where with less than 1/10th of our population, they ended up exterminating large wild animals decades ago. Yet we are neither aware, nor proud, and nor do we celebrate this amazing aspect of India.

Often our science too is based on our perceptions rather than our data. Large animals like leopards and elephants must necessarily have large-ranging habitats simply because of their body size. Yet we believe these animals can and should be confined to tiny Protected Areas even though studies show otherwise. There is no policy

When I started working in 2004, my own ideas of where wild animals should be and what they should be doing were very different from what I went on to discover. My idea of what was 'conflict' has since changed; simple livestock loss is not conflict as it is part of overall damage that farmers incur, and is often miniscule compared to other problems such as disease and theft. As wildlife biologists, we focus only on wildlife damage and then amplify the problem by calling it a war or 'conflict'.

After 10 years of working I find that we often lack the skill to get under the skin of the 'other' side. When we are dealing with conservation issues, we cannot achieve anything without engaging with different groups of people, and as ecologists we are rarely sensitive to humans nor are we trained to engage with them.

India is the only country in the world that is home to both high density of humans and a high density of large wildlife species. We are blessed with

CHANGING PERSPECTIVES, FINDING PRIDE

for dealing with wildlife outside Protected Areas where these animals seriously affect the lives of poor farmers. The media routinely demonises large carnivores, labelling them a menace or man-eaters, without considering the repercussions. Research, management and policy need to look within to reverse the negative interaction between wild animals and humans that share space in India.

Vidya Athreya is a wildlife biologist with the Wildlife Conservation Society - India and is based in Pune. Her interests lie in understanding interactions between species and she has been working on human-leopard dynamics to better understand how problems can be reduced for both species in shared spaces.



April 8, 1978 – September 8, 2014

ARCHANA BALI

By Nandini Velho

Her sweetheart fiancée, mother and brother were close to the military checkpoint in Arunachal Pradesh when they realised that without an Inner Line Permit to drive up the Sela Pass road to Tawang, they would have to turn back. A flurry of e-mails and calls were made to make it happen – this was a trip that was a tribute as much as a journey – a trip to all the places their beloved, Archana, had wanted to work in and visit. Arunachal Pradesh, where I work, was one of the places she had dreamed of – both for its natural beauty and the opportunity, she always said, “of a good roadside *chai*”. So often she would talk excitedly about having her own *chai* stand one day where she’d provide people with not just the best *chai* in India but also great advice on local wildlife conservation.

There were so many places and so much more to Archana’s life and enthusiasm for nature and conservation. It is thus inevitable that this article traces her selfless charisma, love and the fun she brought to wildlife conservation and to her peers through the years. She was part of the first MSc. batch (2004-2006), or “brood” as she liked to call it, in wildlife biology and conservation from the Wildlife Conservation Society and National Centre for Biological Sciences, where I got to know her as my

immediate senior. Apart from imitating the hooting calls of gibbons and engaging in marathon arguments with Dr. Anindya Sinha during the philosophy of science classes – Archana was central to enlivening the campus with her extra-curricular activities and making wildlifers integral to the broader discipline of biology.

Although formally enrolled to do her MSc., her passion for wildlife biology pre-dated this and started when she was much younger. In class 10, she enrolled in her first nature club, and after her first five-day nature camp, she was hooked, never losing her child-like enthusiasm for science education and communication. Soon after, she became a founder member of the Green Hearts Nature Club, Bhopal, where she worked actively on nature education in schools, colleges and in the Van Vihar National Park. Her MSc. work was to understand the scope for large mammal conservation in privately-owned coffee plantations around the Bhadra Wildlife Sanctuary in Karnataka. Her research combined ecological and social science along with analysis of policies and law. Archana’s field experiences were diverse and included sampling of mammals during the day and at night, scat collections, enumerating plants and speaking to plantation owners, workers, forest managers and local non-governmental organisations that worked around Bhadra.

Few people take science to practical conservation as it requires great commitment, but Archana was one of those few. The admiration she won from D.V. Girish – the hands-on conservation practitioner and adviser to the Wildlife Conservation Action Team (WildCat-C) of Chikmagalur was always hard-earned and seldom won by the rest of us. In fact, during her illness, he repeatedly tried to send her coffee from the plantations around Bhadra. Even back in 2007, her work on coffee and forests attracted wide interest during the previous year’s Indian International Coffee Festival held in Bengaluru. She and her

classmate Jignasu Dolia later presented their work titled 'Private lands around Protected Areas – the role of coffee plantations in mammal and butterfly conservation in the Western Ghats, India' to a wide global audience at the Society of Conservation Biology held in South Africa in 2007. This conference remains the largest global conference of conservation professionals and they were awarded the third place for their presentation.

Right from the first season of her Ph.D. fieldwork, Archana remained excited about new ideas in science and nature education. She decided to carry out a six-week film project in the tundra and in her own words the film "took over her life and took a life of its own". The groundwork for this film included writing a total of 2,483 e-mails/applications for permission, corresponding in multiple languages, a visual anthropology course and field training in sea-ice and snow. Undeterred by the challenges and the absence of a formal film background, she bagged the first runner up prize at the 4th Annual Fairbanks Film Festival for her documentary *Voices of the Caribou People*.

Her humility and depth of character was yet another aspect that made her unforgettable. Her environmental history teacher, Dr. Mahesh Rangarajan recalled that she would candidly and smilingly say she did not know a thing about a subject and then go on to master it. She joined the University of Alaska, Fairbanks, as the first Dr. George Schaller Fellow to study *Inuit*-caribou relationships in the context of climate change. At the international caribou meetings in Whitehorse, which was the last conference she attended, as one of the plenary speakers, Archana recounted how when she had started her Ph.D. six years earlier, her professors asked her whether she knew what caribou were like? Whether she knew that they were the only deer where males and females both grow antlers? With a gentle smile she responded that she didn't know much, but that she would go to the field and find out. Her solid body of work on the caribou and *Inuit* people will undoubtedly leave a lasting legacy for the region. One could see and hear this as *Inuit* people watched her videos in a special room at the Whitehorse conference, revelling in the stories of a few of their own recently lost loved ones.

Archana's work spanned the plantations in Bhadra and the caribou and *Inuit* in Alaska and Canada, and is indicative of her expansive interest in wildlife conservation. She could not have looked forward to the adventure of life more. 2013 was the year she was meant to graduate with her Ph.D., marry her sweetheart Dr. Martin Robards (Arctic Beringia Program Director at Wildlife Conservation Society) and do so much more.

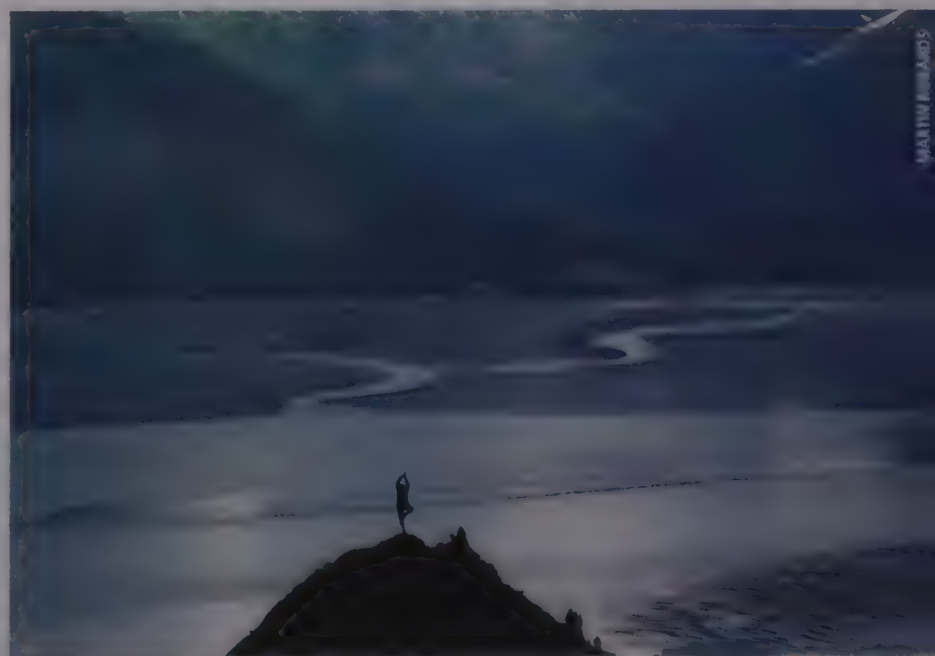
Unfortunately, just four days after the New Year, she was diagnosed with ovarian cancer while she was in India on winter holiday break. I remember that some of her classmates, her Masters supervisor Dr. Kartik Shanker and our course director Dr. Ajith Kumar travelled down to Chennai to be with her. The prognosis was not encouraging for the extremely malignant clear cell carcinoma. After Kartik's visit, he noted that he'd gone to cheer her up, but came away with the overwhelming realisation that it was Archana who had been cheering him up.

She fought with supreme grace and spirit, despite knowing she had just about three months to live. Her treatment started at Columbia Hospital in New York and the one-thing on her to-do-list before her first surgery was to be close to wildlife. So she and Martin went to the Bronx Zoo and spent time with the snow leopards from Pakistan and Mongolia, Amur tiger cubs

from Russia, red pandas from Asia, and white rhinos from Africa. I remember writing letters to her from my field sites in Arunachal and she would often reassure us that she was already a cancer survivor because she had outlived the three-month prognosis. She revelled in the ecological geekiness of "extinction risk" and how this helped her understand her weekly chemotherapy treatments better. She took life by the horns in the precious moments that remained – biking, hiking, sledding, cooking, socialising, and despite weekly chemo, finding the strength and fortitude to enjoy nature in different continents. Martin fondly remembers Archana at a frail 30 kg., diligently following a pair of Nene geese or getting the perfect camera angle for a green turtle in Hawaii, smiling and pondering the ecological significance of these moments in magnificent detail. Even a few months before she passed away, Dr. Ullas Karanth remembers that she continued to be excited about new books and papers in ecology and conservation.

Through sickness and health, her idea of blue skies and sunny days were a deep yearning and love for nature. When Martin asked her once what they were going to do to celebrate a clean diagnosis – road side *chai* on the way to Tawang was the unhesitant answer. Unfortunately, they made that journey to Arunachal without Archana. A year and a half after being diagnosed, she passed away on September 8, 2014, surrounded by her family and in the arms of Martin, selflessly letting us know that she'd miss us in her last breaths.

Although Archana Bali lost the battle to cancer, she never lost her smile as she maintained the upper hand for so long – more than anyone dreamt of. During her last few hours, her MSc. classmate Dr. Anish Andheria sang one of her favourite songs to her on the phone "*Zara chehra toh dikhaao, aur thodasa muskurao* (roughly translated to please show us your face and smile)." This song reverberates through our memories and our thoughts about losing Archana – thoughts that are deep and multi-faceted yet so tender and treasured. Thank you Archana Bali for making us more human, for all the smiles, the deep care and love for nature and people. As has been said, "You were the first of the best" and like you miss us, we miss you so dearly. 🌿



FACING PAGE A few months before her diagnosis - Archana Bali at the Yellowstone National Park in U.S.A.

ABOVE Archana from Martin's vantage point, soaking it all in at Hope Point, Alaska.

Lines of BLOOD

By Neha Sinha



What is the shortest distance between two points? Geometry lessons say the answer is a straight line. But real life teaches us that the world doesn't obey textbooks. In the real world, connecting two lines on the ground would involve encountering a rush of water, the whisper of forests, the clamour of cities, and the undulation of hills. In real life, the shortest distance between two points would be the straightest; but invariably, the shortest and straightest line is not always the best one.

Projects in 'lines', or 'linear' projects, have an enthusiastic new benefactor

the National Democratic Alliance (NDA) government, which has fast-tracked all linear projects – roads, highways, transmission lines, pipe-lines, among others. As per the government's own announcement, in the next few years, a 3.8 billion dollar outlay is planned for highways in India, which will complete 1,00,000 kilometres of highway by 2017. The NDA government has invited public-private partnerships for roads and highways, possibly why a 'unified policy' has been made for all roads. All roads and linear projects will be, literally, in the fast lane (refer box). Tragically, these

alignments are also lines drawn in blood in the natural world. A stroke of road, an abrasion of transmission lines, a welt of railways – these are all efficiently cutting animals into shreds, and wildlife areas into fragments.

THEY FALL ONE BY ONE!

One of the best known forests of India, declared a "crucial corridor" by none less than the Supreme Court, is set to be further fragmented. The government is keen to four-lane the existing National Highway 7 (NH7), which connects Kanha to Pench Tiger Reserve, and Kanha to Nagzira Tiger Reserve. This two-lane highway is in disrepair, but even in this state, it exacts a heavy toll. A local citizens group, NH7 Crusaders, estimates that more than 1,030 animals have been killed on NH7 in about 400 days. The proposal to double the highway lanes may well lead to the death toll doubling, or worse.

On the recommendation of its forest bench, the Central Empowered Committee, the Supreme Court had earlier turned down the road-widening proposal. More than a thousand concerned citizens have signed an online, self-made petition to not widen this highway and further jeopardise the forest. More than 45 NGOs have written to the Prime Minister asking him to reconsider the project. The Wildlife Institute of India is working on a second version of a mitigation plan, and there is no agreement on what mitigation work needs to be undertaken by a government in a hurry. Yet, despite the lack of any working plan or adequate Stage II environmental clearances, the tree-felling in this forest stretch has started.

Why this haste? And why this particular stretch? The answers may not abide by reason, but an alternative surely is reasonable to ask for. NH67, which passes through Nagpur and Chhindwara, is operational. Using this highway instead of widening NH7, would mean a detour of just 70 km. On a road without traffic lights, that's a maximum of two hours more of travel time. "Till recently, NH67 was a state highway. It was later expanded

Wild victims of linear alignments: this flattened Indian fox was spotted on the highway between Bikaner and Jaisalmer

to a National Highway, at great public cost," says Milind Pariwakam, a biologist who works in this area, and is at the forefront of a legal battle to save the Kanha-Pench corridor. We have made mistakes in the past, and we should not repeat them in an area inhabited by tigers for generations, he stresses. "NH6 and NH7 have already destroyed six tiger corridors by not putting in any mitigation measures. The Kanha-Pench corridor has one of the best connectivity among all corridors in the country. If we cannot save the best, we can forget about the rest," he says.

DESTRUCTION UNLIMITED

The rest of the linear projects, too, are burgeoning in number. As per data submitted to the Lok Sabha, at least 16 tiger reserves have one or more highways passing through them. As

FLAMINGO CITY IN PERIL

Flamingo City in Gujarat is the only known breeding colony of flamingos in the Asian subcontinent. This area is flat, massive, mostly pristine and seasonally flooded. The waters here are unique: a curious mix of fresh and saline water that makes this area a hotbed for flamingo breeding. The area holds rows upon rows of the unique mud nests made by flamingos. The Gujarat government has for years been pushing a proposal for creating a road here, which they say is at the behest of the Border Security Force. Due to the flat terrain here, the road will be made just so it can be used during the monsoons. To avoid the seasonal wetlands, the road will thus be elevated, which also means it can seriously affect the hydrology of the area. Once the road is made, not only may the water composition change, tourist activities, garbage and pollution will also follow. Keeping these factors in mind, the National Board for Wildlife (NBWL) under the UPA government had turned down the proposal for this road, but the NBWL constituted by the new government has given it the go-ahead.

per the Make in India programme, it is likely that these highways too will be expanded. It is now imperative to have an integrated vision and avoid areas that pass through irreplaceable habitats. Where bypasses are not available, existing highways should be repaired but not widened.

Apart from roads, there are also serious concerns with other linear

projects. Each year, birds such as flamingos, Great Indian Bustards and pelicans are electrocuted on overhead electric lines. As far as railways go, it appears we have lost the battle for any sort of mitigation. In 2013, the world held its breath when seven elephants – yes, seven – lost their lives in a single collision with a train on a railway track in Jalpaiguri. For all their

JUST HOW IMPACTFUL CAN A ROAD BE?

I'll start with a simple analogy. What's the biggest road you have ever crossed comfortably? Two lanes, a maximum of two lanes, with a central verge is probably the answer most will give. How fast would you need to sprint to cross a four-lane road, if there were no traffic lights, no zebra crossings, and no rear-view mirrors?

Despite their sheer numbers, and their recorded impact, linear projects, especially roads and railways, have been fast-tracked by the NDA government, arguing that they do not have much impact. While there is no formal definition of linear projects, these include transmission lines and pipe-lines, roads and highways, railways and canals. Typically, linear projects pass through several states. The government has recently relaxed a gamut of clearance requirements for these projects. For instance, all linear projects will be 'fast-tracked', Gram Sabha clearance will not be required for them, and the work on such a project can start without forest clearance. In border areas, linear projects will not require scoping or public hearings as part of their Environmental Impact Assessments. Environment Minister Prakash Javadekar has said this is to "set in place a policy" for these projects, to ensure, for instance, that every Highway is (speedily) cleared, and the same rules apply for all roads. The Controller and Auditor General finds, in a new report, that roads lead to secondary disturbances, mushrooming of uncontrolled shops, pollution and garbage, as in the case of NH37 passing through the Kaziranga National Park.



The blood red line on this map marks the alignment of NH7 through the Kanha-Pench corridor. The yellow section signifies the stretch approved for tree felling.

unclaimed sorrow over the incident, neither West Bengal Chief Minister Mamata Banerjee nor the Union Environment Ministry did anything to mandate change in the way trains run. Trains continue to go through wilderness habitat, do not follow speed limits, and are pushed forward by more and more traffic backlogs.

On the question of mitigation for highways and roads, there are numerous issues to be considered. Many mitigation measures involve built-up infrastructure, like culverts, and underground tunnels for wildlife to cross roads. Since wild animals do not attend traffic lessons, it is hard to determine whether an animal will actually cross using a culvert. Thus, several mitigation plans suggest fencing all along the linear intrusion to enable crossing only from earmarked areas, which actually leads to habitat fragmentation in its most classic form. Other aspects to be considered

are that culverts and other such structures can become hotspots for poaching or can flood over. For all the infrastructural mistakes we have made in the past, there is logic, and ethics, pointing us towards just leaving certain forest areas as clear of vehicles and intrusions as possible.

The very basis of making a unified policy for linear projects, bulwarked by the idea that these projects do not

actually cause much harm to wildlife, is a mistaken notion. History is proof of this. 🐾



A practicing conservationist with the Bombay Natural History Society, a guest faculty at Deakin University and environmental commentator, Neha Sinha is particularly interested in environmental policy and alternate sociologies of development.

STOP PRESS

On May 6, 2015, Justice Swatanter Kumar, Chairperson of the National Green Tribunal, delivered a stay order on the state granted permission given to the National Highway Authority of India for the diversion of forestland for the expansion of NH7.

The order came in the wake of a petition filed by Srushti Paryavaran Mandal, a Nagpur-based NGO. Unfortunately, a reported 3,394 trees of the 3,600 earmarked for cutting, have already been felled between Mansar and Chorbahuli. This fact may be exploited by the project proponents to push the project through.

Meanwhile, the Wildlife Institute of India is expected to submit a fresh mitigation plan to Minister Prakash Javadekar in the coming weeks.



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BANO HARALU



In October 2012, stark photographic and video evidence of fishermen training their fishing nets to the sky to trap thousands of migratory Amur Falcons stunned the world of conservation. With three others, I was able to document this 'dark harvest' around the Doyang Reservoir in Nagaland's Wokha district. On that trip we estimated 1,40,000 birds being exterminated between October and early December every year. The shrill cry of the captured birds echoed in my ears while the sheer numbers spelt disaster before my eyes. The encounter jarred my senses and my understanding of the *Naga* community. Local hunters would later tell us that our figures were an insult and that the truth was far uglier – more than double our estimates!

As we documented the spoils of one hunter after another, my mind raced. How on earth were we to tell this story and follow it through? Nobody likes to be told they are wrong, more so with hard evidence to prove their culpability. With hunting upheld as a traditional right in Nagaland, I was sure we would face a storm of opposition, maybe even violence! It was soon time to face my fears following the media blitzkrieg; 'Massacre of the Amur Falcons' on www.conservationindia.org by Ramki Sreenivasan and Shashank Dalvi in whose company I unearthed this horror.

I found myself attending a meeting organised by the Forest Department in the heart of the 'killing fields'. I was easily the unhappiest person in the room, full of village elders and community leaders. My anxieties were misplaced. Not one person in the room questioned the story in the newspapers.

Instead they wanted to know what we felt was wrong in hunting birds that they regarded as 'manna' from heaven! My sympathies that afternoon were with the forest officer. He faced a barrage of angry villagers, incensed by elephants destroying their paddy fields and inadequate compensation. The flight of the Amur Falcon paled by comparison.

The questions and doubts raised at a series of such meetings resulted in one of the most successful campaigns to be launched in India in decades. 'Friends of the Amur Falcon' was born from such community consultations and the primary strategy we employed was to educate children on issues relating to nature conservation and its benefits on the quality of their own lives. We have just about 100 children enrolled in five

NOTHING VENTURED, NOTHING GAINED

eco-clubs, one in each selected village. In a show of solidarity, four credible organisations joined hands in the mission in 2013 – Wildlife Conservation Society, Raptor Research & Conservation Foundation, Bombay Natural History Society and Wildlife Conservation Trust.

In under a year of the exposé and roughly six weeks before the migrating falcons flew in from Mongolia (enroute to South Africa), the village councils of Pangti, Sungro and Aasha imposed a ban on hunting Amur Falcons. For the first time in 10 years the birds would be guaranteed safe passage over what is now recognised as the world's largest Amur Falcon roosting site!

I am often asked what influenced the village council to impose the ban. How could the government overlook this scale of hunting that had gone on for decades? I have no answers. It really seemed like the timing of our visit, the impact of the report, the response of the village council and the willingness of the hunters to give conservation a chance, was orchestrated by a mightier force.

Bano Haralu is a pioneering television journalist of Northeast India. After two decades of reporting, she returned to Nagaland in 2010 to work for nature conservation. She formed the Nagaland Wildlife & Biodiversity Conservation Trust in 2013 and serves as its Managing Trustee.

UNCERTAIN DESTINIES

Coral choice and fate in disturbed reef systems



Text and photographs by Shreya Yadav

Kadmat appears before us under large castles of cumulus, a thin strip of land that breaks the horizon in two. The sea is a marbled mint green, and the reef a blue under moving water. As we pull into the island, details of land emerge: coconut trees, white sand, tiny boats picked in the lagoon. It is difficult to believe that these skulls are among the most vulnerable in the world today. From a distance, life seems languid, traced in lazy portland cement. But if

change is inherent to any system, then perhaps nowhere is it better illustrated than in the reefs of the Lakshadweep.

BLEACHING AND RECOVERY

The El Niño event of 1998 devastated the world's reefs, causing the worst coral bleaching in recorded history. The Lakshadweep lost almost 90 per cent of its live coral that year. Since then, its reefs have suffered a series of warm water events, each episode

further weakening the bond between coral and its symbiotic microalgae. When seawater temperatures rise beyond a certain threshold, the coral animal expels its photosynthetic algae, bleaching a dull white. Bleached coral are more susceptible to starvation and disease. After an event like this, the reef can die rapidly, forests of coral giving way to grey metropolises of stone and seaweed.

But the Lakshadweep has deviated from this narrative of decline and death.



Since 1998, and through the repeated coral bleaching events of 2005, 2007, and 2010, the reefs here have shown a surprising capacity to resist and recover from stress. Why? What makes some reefs recover and others die? That is a 16-year-old question, one whose subtleties have intrigued coral scientists since the mass coral bleaching of 1998. The only thing that can be safely assumed is that for recovery to begin, coral must take root again and grow.

CORAL LIFE HISTORY

Corals, like many other marine creatures, have two very different phases in their lives. In their early days just after fertilisation they are wandering larvae.

going more or less where local currents take them. Most are eaten by fish and other creatures. Some may starve to death, and others never reach a home. A tiny fraction survives the vastness of the open ocean. By the time these larvae reach a reef, they can smell and feel where they're going. This is the only time in their lives they can choose for themselves. And they must pick the best place to settle. Once this choice has been made, their fate is sealed. Much like a tree that has taken root, they will remain here till they die.

A reef, like any other habitat, has prime real estate, areas with an ideal amount of sun and shade and nutrients. But one that has been through many

disturbances is a changed system. Today, recovering reefs are often just graveyards of coral, dead colonies that once grew in an explosion of colours and intricate forms. But, unlike a forest where destruction is usually associated with a flattening of habitat area, reefs may retain their inherent structure for much longer. The coral might be dead, but its skeleton still persists. Under this

FACING PAGE Some reefs in the Lakshadweep are showing signs of recovery. However, a reef's full recovery is dependent on a variety of factors including herbivorous fish and coral larvae produced.

ABOVE The fate of this young coral of the genus *Acropora* depends on a multitude of factors including the resilience of the structure on which it grows.

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altered scenario, the 'coral reef' comes to resemble a ghost town of sorts, where there is little live coral but where signs of an earlier vibrancy still linger in washed-out patches of branching coral or in grey tables and massive boulders that still stand erect on a reef. A coral larva that reaches a reef like this has a variety of dead structures to potentially land on. One of the strongest cues that guide them to a habitat is substrate – the stuff that covers the surface of something. In the Lakshadweep, as in many other reefs in the world, surfaces covered in a certain kind of bubblegum-pink alga (called *crustose coralline* algae) tend to be preferred by coral larvae to other substrates like seaweeds and thick turfs, which are usually avoided.

These substrates, however, are not distributed evenly between structures. As a result, coral larvae tend to crowd on to certain kinds of structures more than others, which, in a recovering reef, are primarily the skeletons of older coral. These, too, differ in their stabilities, with some – like massive boulders – much more resistant to breakage and storm damage than others, like dead tabular coral or bits of rubble. Some skeletons, therefore, will 'live' longer than others, allowing the coral that has settled on them to also survive for longer. It's like the underwater version of the *Three Little Pigs* story: some structures are stronger than others, and coral larvae that settle on forms that are able to withstand the 'huffs and puffs' of the monsoon are the ones that are most likely to survive to become adults. What happens, then, if some of the weaker structures are covered in substrates – like *crustose coralline* algae – that attract coral larvae? In this case, larvae may be making the right choice at the time of settlement, but their final fate is in the hands of the withstanding capacity of the underlying form.

RECOVERY IS NOT SIMPLE

In the Lakshadweep, the five-month long south-west monsoon plays a large part in influencing the kind of structure a reef retains. Are the reefs that are declining, then, the ones that are made up of the most amount of dead unstable structure? In contrast, are areas that are cleaned of all their loose skeletons the ones most likely



TOP A post-disturbed reef is a graveyard of dead coral skeletons on which new coral can settle and grow.

ABOVE A forest of coral growing in the lagoon

to support sustained coral growth and recovery? Of course, it is not as simple as this. A host of other factors like the abundance of herbivorous fish and the number of coral larvae that are produced by mature adults are crucial processes for coral reef recovery.

Understanding how the resistance and resilience of a system is maintained can help manage the changes we might see in the near future. With a weakening barrier of coral to fortify the land, the coasts of islands like Kadmat have become more prone to erosion, and its groundwater to salinity. Storms that might have been

broken by the reef instead reach land without buffer. Amidst these uncertain destinies, the lives of pre-Cambrian coral may be able to reveal more about the future than we think. ■



Shreya Yadav is a Research Affiliate with the Nature Conservation Foundation Mysore (www.ncf-india.org). This article is based on the work she has been doing in the Lakshadweep islands with monetary support from the Ruffords Foundation, U.K.

NO SET WAYS

Sitting alone with a camera for hours, in the middle of a wild grassy patch atop a little knoll, filming hundreds of Amur Falcons taking turns to fly in amazing formation above you, and landing on the wires.... nothing can take away the peace, the silence, the magic of that moment.

Filming in the company of an old woman, who has to walk miles to collect firewood for sale in a nearby town to feed her grandson, because the forest near her village is gone... nothing can take away the sadness, the disturbance, the immense helplessness of that moment.

My journey in conservation has been through filming myriad such moments across India, experiencing the multiple layers of experience that exist in our country – constantly challenging our ideas of conservation, livelihood and survival; and using the visual medium to bring forth these questions and thoughts.

Two decades later, I continue to experience moments, both magical and stimulating, but what still remains is hope and inspiration from hundreds of people and groups I have been privileged to encounter, working on the ground – in remote areas, in tough conditions – bringing back water to a village, helping save a species from disappearing, risking life to stop a forest from getting logged.

I strongly believe that the visual medium is a powerful tool for supporting such work, and catalyzing change. Over the last seven years, the direction of my work has been to give strength to this idea.



Technology has brought about a sense of interconnectedness and inseparability in this world. It can transform lives, usher in new perspectives and bring fresh learnings to communities. It also offers a voice to people living in remote areas so they can share their world-views and their life experiences, and record the changes that are happening and the things that are disappearing.

The Green Hub, our latest project is deeply rooted in this idea. We seek to engage and empower the youth of communities to help them discover their own biodiversity conservation ethic through an innovative model of using the visual medium. The hope is to restore and revive in them the love and respect for protecting their natural resources, and become the environment spokespersons for tomorrow. The Green Hub envisions to connect the individuals, organisations and groups working with conservation to form a web of learning, sharing and action.

While the stories of hope are endless in our country, the need to escalate work towards conservation is urgent. Many young people ask me how they can help. I guess there are no set ways. If one can use one's strength – whichever field it maybe in – that's all it takes. The fact remains that we don't need to save the natural world for 'just wildlife'. We need to save it to ensure the dignity and survival of human life.

Winner of multiple Green Oscars, Rita Banerji heads Dusty Foot Productions, a wildlife and environment film-making and communications agency. She has recently started Green Hub – a community and youth-based video documentation centre for work related to the environment in North East India, in collaboration with North East Network.



DIVYA MUDAPPA



At first, working in two of the most magnificent Protected Areas of Tamil Nadu – the Kalakad-Mundanthurai Tiger Reserve and Indira Gandhi Wildlife Sanctuary and National Park (now the Anamalai Tiger Reserve), it seemed that only large swathes of forests are required for wildlife conservation. But one learns as one continues to work – that even small forest fragments can support a surprisingly high diversity of species, as can the plantations surrounding these remnant ecological oases.

Conserving the pieces that remain poses its own challenges. Staving off pressures on the remnants, as on every piece of land, is an everyday battle and nightmare. As we initiated a long-term conservation programme in the Anamalai Hills, we decided to work with the stakeholders – in this case, large, land-owning plantation companies – to recognise and protect fragmented forests and, where necessary, restore and manage them to enhance diversity and their functioning.

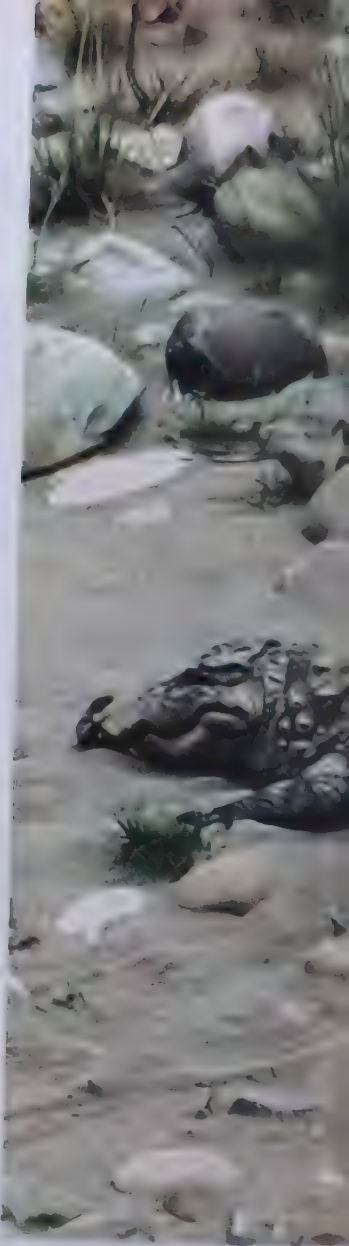
RESTORING THE FABRIC

For over a decade now, this has been the focus of my research and conservation efforts: restoring rainforests and fostering ecologically-sensitive plantation land use. In India, we are fortunate that a lot of wildlife persists outside Protected Areas and that people are tolerant towards these species. Working together with various kinds and groups of people is essential to retain the cultural fabric of coexistence, and ensure that it is not worn away under the pressures of economic growth, development, and intolerance.

Dr. Divya Mudappa is a scientist with the Nature Conservation Foundation. Her primary research interests lie in tropical ecology, particularly rainforests, and applied ecological subjects such as restoration ecology and conservation biology.

H eading outdoors, into forests, among animals of all sorts was always something I found irresistible. Still, it was not until I entered college to study zoology that I learnt that wildlife science and field studies were not only a career option, but something more than that. After my Bachelors degree, I pursued a Masters in Ecology and then joined the Wildlife Institute of India to work on field projects, learn from various experts and develop my skills.

I was most intrigued by rainforests. Over the years, I went on to study animals, large and small – from rodents and small carnivores to hornbills and elephants. The more I learned about animals, the more I understood the role of the multitude of rainforest plant species, particularly trees, which supported them. In return, animals such as hornbills and civets help maintain the dynamics of their chosen habitats, thus ensuring the survival of entire ecosystems.





Croc Tease

Text and photographs
by Neeraj Garg

The heat of the day had given way to an overcast evening, and my colleagues Raminder, Prem and I were staking out Crocodile Point near the Gairal Forest Rest House of the Corbett Tiger Reserve. Sixty metres below us, a mugger was snoozing soundly on the riverbed unmindful of our waiting cameras.

It was just as our attention began to wander, that we sighted a smooth-coated otter ambling along the sandbank. Almost simultaneously, the otter sighted the croc and reared up on its hind legs to scrutinise the dozing predator. Common sense dictated that the mustelid, having sensed danger, would bypass the reptile and continue on its way, but to our surprise the otter made a beeline for the croc!

We held our breath as the plucky little mammal approached the crocodile's hind quarters, half expecting the reptile to be feigning sleep and readying a furious attack. Did this foolish otter have a death wish? We watched in rapt horror as, with whiskers aquiver, the audacious animal sunk its teeth into the crocodile's tail! The poor reptile jolted awake, madly swinging its tail, to which the otter clung undaunted. The croc frantically tried to dislodge the assailant, finally succeeding and then swinging around to confront the otter.

Our jaws dropped as the little guy stood its ground, levelling with the reptile, before nonchalantly turning around and strolling away. Probably leaving the crocodile even more dumbfounded than us. 🐾



TOP LEFT AND TOP RIGHT

Location: High Bank, Gairal, Corbett National Park, Uttarakhand.

Camera: Nikon D7100, Lens: Nikon 200-400 mm. f4G ED VR-II, Shutter speed: 1/250 sec., Aperture: f/4, ISO: 1600, Focal length: 400 mm.,

Image taken: March 29, 2015; 5:43 p.m.

BOTTOM

Location: High Bank, Gairal, Corbett National Park, Uttarakhand.

Camera: Nikon D7100, Lens: Nikon 200-400 mm. f4G ED VR-II, Shutter speed: 1/320 sec., Aperture: f/4, ISO: 1600, Focal length: 400 mm.,

Image taken: March 29, 2015; 5:43 p.m.

LESSONS LEARNED



A defining moment in my career was reporting on an illegal mine operating on forest land in Goa and facing a life-threatening situation, which I walked into without realising! The mining mafia blocked our way, then got the cops to slap a trespassing case on us. They would not let us go till we handed over our tapes, and tried to intimidate us. I did give them tapes – blank ones – and walked away unscathed!

There was much I learnt that day; how a system can work against anyone, even those supposedly protected by their media status. Also how one honest forest officer can help, and how the judiciary is truly our last hope (they came to

our rescue on our return to Delhi in the case we filed against the mining company).

As for being a woman reporting in the field, I don't think I have ever seen it like that. We are all here to do our job – as men or women. Perhaps the only time it hit me was while on a trek to Gangotri, where I was the only woman in a dormitory full of snoring men with smelly socks! Of course the perils of reporting on wildlife and environment are many, especially since your story may not always be the biggest of the day and Sachin Tendulkar's haircut may get more playouts! But you are rewarded by living under open skies, close to nature... as others sit behind closed doors on laptops. I consider myself truly blessed just for that chance to be out in the open in the forest with all creatures great and small.

Wildlife biologist, intrepid journalist and committed conservationist, Bahar Dutt has been responsible for transporting environment reportage from an obtuse segment on television to prime time news space. A columnist with Live Mint, Bahar has most recently turned author with the release of her book Green Wars. She won a Sanctuary Wildlife Award in 2008.

NAINA LAL KIDWAI



My early exposure to wildlife was through the *National Geographic* magazine, and I am delighted that *Sanctuary Asia* today fills this void and even better that it captures Indian stories and breathtaking photographs by Indian wildlifers.

I think one of the best ways of preserving our rich natural heritage is to enjoy wildlife experiences with the family. Passing this passion from generation to generation, we have a family of avid wildlife enthusiasts as a result.

I also believe that kids from local schools need to be exposed to the forest. Often, children growing up around the park have never been into it! Promoting local crafts and generating employment from tourism could provide low impact livelihood opportunities. Local community engagement which benefits them would help to win their support for the conservation of our forests and wildlife

BRIDGING THE VOID

The rhino population increasing in Kaziranga from about 250 to over 2,500 and the recent increase in tiger numbers are encouraging. We need more corridors linking our forests to reduce human-animal conflict.

What can be better than listening to the sounds of the forest, birdwatching, sitting quietly with binoculars trained on a Spotted Owlet, and then have the tiger pay us a visit!

Business executive and banker, Naina Lal Kidwai is also an ardent wildlife lover. She is currently Chairman, India, and Director, Asia-Pacific of HSBC.

KIRAN BAJAJ



If I can do it, anyone can.

I wasn't born an environmentalist. I grew into one. A decade ago, perturbed by the rapid onset of global warming and the increase in natural disasters that were linked to human activity, I gave up my successful career as the CEO of the Bajaj Group Travel Agency, Hind Musafir, to fully engage in environmental issues.

In 2004, I registered the NGO Paryavaran Mitra (Friend of the Environment) which has, ever since, taken a multi-faceted approach to

tackle air, water, land and sound pollution. From awareness drives to organic farming, and the restoration of dry wells to the cleanup of polluted lakes – Paryavaran Mitra has truly lived up to its name.

The 2,00,000 trees planted by us on the erstwhile wasteland that surrounded Bajaj's Hind Lamps factory has transformed the area into a haven for birds. Beyond

EVERYONE'S BUSINESS

that we have successfully converted Bajaj Electricals into a tobacco-free company. Understanding that industry depends on environment, promoting a safe environment remains at the top of our agenda, an example we hope other corporates will emulate.

My life-commitment is to play my part in healing the Earth. The flowers and birds that have made my headquarters, Shikohabad, their own, hold me firmly to my promise. More at: www.paryavaranmitra.org

A strong believer in the Gandhian ideology of simple living and high thinking, Kiran Bajaj has been working under the radar to bring environmental awareness and women's welfare issues to the fore wherever and whenever she can.

WHEN ART TAKES WING

By Sangeetha Kadur

Birds portray an exquisite charm of their own. Their extraordinary power of flight sets them apart from most creatures. I wonder if it's their colourful feathers, their unique forms or their playful, inquisitive behaviour that has for so long captured my attention.

My rendezvous with the wild started in my childhood since I grew up in a family of nature enthusiasts. Most of my vacations, weekends, and time offs were spent in forests and wildlife sanctuaries. Spending time in the wilderness was a beautiful routine that got ingrained into my day-to-day life. Like most children, I was naturally drawn to spotting large ears, long tails, big eyes, spots, stripes and snouts. In those days, I didn't fancy watching birds as much, but nonetheless, I was secretly proud to be amongst the very few in school to know that the long tailed green birds were 'parakeets' and not 'parrots'; the common raptors in the city were 'kites' and not 'eagles'. Though my art college days confined me to an urban space, many enlightening interactions with a brilliant birdwatching group in Bengaluru brought me amongst like-minded, passionate naturalists. And this is where my fascination for the world of birds grew.

With a keen interest in art intimately bound with my passion for the natural world, I set out on a path of exploring a career as a wildlife artist. Within a couple of years into this uncertain journey, I joined Felis Creations, a visual arts company with a focus on conservation. This helped me carve out a professional niche for myself. My first commission was in collaboration with Gorgas Science Foundation, USA. It was a project to paint the smallest, most agile, finely gorgeted, iridescent flying jewels of the New World – the hummingbirds! It involved composing each of the plates of the book with various bird species, their respective flora and habitat, capturing their proportionate sizes, forms, behaviours, colours and detailing. Painting the first volume of this book turned





NECTAR FEEDERS

Most hummingbirds are attracted to red blooms and inflorescence. Illustrated here are the male and female Ruby-throated Hummingbird *Acrchilochus colubris* and Black-chinned Hummingbird *Acrchilochus alexandri*, feeding on red buckeye *Aesculus pavia*. This illustration was nominated as a finalist at the BBC Wildlife Artist of the Year 2009 in the 'World Birds' category.
Medium: Acrylic on Arches watercolour paper



BROWN-HEADED PARADISE KINGFISHER *Tanysiptera danae*

Endemic to the islands of Papua New Guinea, this Brown-headed Paradise Kingfisher belongs to a group of tree kingfishers characterised by their elegant, long tail streamers. There are eight species of paradise kingfishers in the world.
Medium: Acrylic on Arches watercolour paper

out to be more than just a learning process; it was a rewarding experience getting a peek into the life of this exquisite bird.
With the insights gathered from the hummingbird project, I went on to paint many diverse species of birds and animals. With every life form that I draw, I seem to observe more intently. I realised that learning is extremely profound in art. The intensity of focus required to first imitate and then recreate something with my lines and strokes is constantly challenging and yet immensely gratifying.

COPPERSMITH BARBET *Psilopogon haemacephalus*

You can usually spot a Coppersmith Barbet in any of the fruiting fig trees, as figs are an important part of their diet. Though patterned with a riot of colours, this little green blob could easily go unnoticed within leafy foliage.
Medium: Pen, ink and watercolour on paper



KINGFISHERS IN THE MIST

While a Pied Kingfisher *Ceryle rudis* hovers over the still waters of the misty morning; the Common Kingfisher *Alcedo atthis* and the Stork-billed Kingfisher *Pelargopsis capensis* perch over stumps of dead wood and patiently wait for their prey.

Medium: Acrylic on Arches watercolour paper





FIRE-TAILED SUNBIRD SEQUENCE

An inhabitant of high-altitude rhododendron forests in the Himalaya, the Fire-tailed Sunbird *Aethopyga ignicauda* is one of the 12 species of sunbirds found throughout India. Although they are nectar-feeders, these sunbirds occasionally supplement their diet with insects. The above painting depicts a Fire-tailed Sunbird making spectacular aerial sallies, behaving more like a flycatcher than a sunbird. This painting was among the finalists in the International category at the BBC Wildlife Artist of the Year 2012 competition.

Medium: Acrylic on paper

As an artist and a naturalist, capturing a captivating glimpse from nature and bringing it upclose to the eyes of the viewer carries a sense of responsibility that I cherish. And yet, in the end, it's not the painted canvas, the skill and the appreciation alone, that I seek. If through my art, I can truly create a spark of wonder, a curiosity and an admiration that connects the two worlds, that of the illustrated with that of the existing, then, it seems all worthwhile. As I continue on this journey with this ever diverse natural world, I wish to render everything that leaves me inspired.

ULUGURU BUSH-SHRIKE *Malaconotus alius*

Hardly ever photographed in the wild, it is regarded as the rarest of all the birds of Africa. This critically endangered canopy dweller is confined to a small area of the Uluguru Forest Reserve, with population estimates of less than 1,200 pairs in the wild.

Medium: Acrylic on paper.





Centipede Care

The animal kingdom does not suffer from a paucity of super moms. Elephants, eagles and crocodiles... you would have a hard time honing in on the most protective mothers but don't forget to consider centipedes. Yes, centipedes! One wouldn't expect these multi-legged creatures to be good mothers, but a surprising number of them are known to care for their offspring.

Centipedes mate in a manner typical of many arthropods – the male produces a packet of sperm called a spermatophore, which the female uses to fertilise her eggs in a pair of internal sacs known as spermathacae. In some species, the male inserts the spermatophore into the female's body, while in others; the male just leaves it on the ground for the female to claim. The female is capable of maintaining live sperm in the spermathacae, and can lay viable eggs even six months after 'mating'.

The egg-laying locations and habits of centipedes vary according to species. Females of some species go on their way after laying eggs in the hollows of rotting logs or after rolling them into the soil as soon as they are laid. Others actually look after their eggs and young. A typical clutch contains between 20 and 60 eggs.

Arun Kumar stumbled upon this tropical centipede belonging to the order Scolopendromorph at the Bhagwan Mahavir Wildlife Sanctuary in Goa. A female scolopendromorpha centipede had curled protectively around her egg clutch. The species is known to stay curled until the young hatch. She will also periodically lick the eggs to prevent the growth of fungus. However, if she is disturbed during this time, she may abandon the eggs or actually eat them. After around one month in the eggs and another with their mother, the young centipedes will be ready to disperse and lead independent lives. —

Location: Bhagwan Mahavir Wildlife Sanctuary, Goa

Photographer: Arun Kumar

Camera: Panasonic DMC-FZ200, Shutter speed: 1/50 sec.,

Aperture: f/2.8, ISO: 400, Focal length: 4 mm

Image taken: June 28, 2013; 5:25 p.m.



**Help save our tigers, our forests,
our water - and ourselves.**



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Half of the world's wild tigers live in the forests of India. Despite roaming over vast areas of Asia a century ago, today habitat destruction and poaching are pushing our national animal to the brink. Global wildlife poaching represents the largest illegal trade in the world after arms and narcotics.

With climate change threatening human societies across the globe and in India, forests such as Kanha, Corbett, Mudumalai and Pench, the home of the tiger, are invaluable. They sequester carbon and store water, providing invaluable services to human society. In return, we need to protect them.

The Ashok Piramal Group is committed to saving the environment for the benefit of future generations.

Photo: Harsh Piramal.

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DR. KRITHI K. KARANTH



meant that the project I had spent months planning, obtaining funding and permissions for was over. But I was determined to complete this project. A month later, I hobbled back, and resolutely began walking transects in pouring rain, getting bitten by leeches, and tramping through rugged mountainous terrain to collect data. Though physically painful and mentally challenging, the three months I spent in this amazing park reignited my childhood passion for wild nature, effectively pushing me to become a conservation biologist.

Over the years, I have been lucky to work and travel to thousands of villages and explore many wild places in India. Every field experience reinforces my belief that we still have a lot to protect and that every conservation battle matters. Ensuring wild India thrives, while solving people's needs, is the focus of my research and conservation efforts.

SOLO SCIENCE TO CITIZEN SCIENCE

Having grown up exploring the forests of India with my father Ullas Karanth (tiger expert and conservation biologist), I had an extraordinary albeit unusual childhood. I spent hours observing animals and exploring wonderful places, and had the unique privilege of watching and learning from my father as he collared and tracked wild tigers and leopards. As an only child, I had to learn to adapt to simple and challenging environments and to find ways of staying out of trouble. However, the hardships he faced as a scientist and conservationist made me decide, as a teenager, not to pursue a career in wildlife.

Many years later while studying for my Masters at Yale, I found myself designing a research project that examined people-park interaction in Karnataka's spectacularly beautiful Bhadra Wildlife Sanctuary. A car accident on the second day of my field work resulted in a cracked kneecap, leaving me distraught. For me this

My research now takes place in seven Indian states, and this effort has trained over 500 Indian citizen science volunteers in the collection of scientific data. This has resulted in the publication of more than 35 peer-reviewed papers in journals of repute. These volunteers have come from all walks of life, aged 18-50, from as many as 15 Indian states. Most people volunteer because they care for wildlife, but the individual and personal field experiences they gained probably afforded them a much deeper, more nuanced understanding of the conservation challenges facing India. I believe that citizen science is critical to engaging the public to care for and participate in wildlife conservation.

Dr. Krithi K. Karanth is an Associate Conservation Scientist with the Wildlife Conservation Society, a Ramanujan Fellow at the Centre for Wildlife Studies, and an Adjunct Assistant Professor at Duke University. Her research spans 17 years and a broad variety of issues. Dr. Karanth was selected as the 10,000th Grantee and Emerging Explorer for the year 2012 by National Geographic.

THE FEMALE OF THE SPECIES



RUDRA MAHAPATRA/WTN

By Vivek Menon

I was thinking, rather randomly one International Women's Day, of the seven favourite clichés that a man might use when he thinks of the word 'woman'.

I came up with a list of attributes – some of which, admittedly, women have tried to dissociate their collective persona from – and for the intellectually frugal but nevertheless compelling reason of having nothing else to do on a sunny afternoon, I applied them to all the lady animals I could think of.

Now when I say lady animals I mean the female members of a species, and not *individual* lady animals like Sundari, the lady dog in my house. And as I unfold my list, I hasten to clarify that it is in boring old alphabetical order – lest I be accused of bringing any of my gender's biases to the fore.

BEAUTY

First on the list (alphabetically, mind you) but also the most difficult to find Aphrodites, Sophia Loren's, Cleopatras and Kareena Kapoors abound in the

human world, separated only by space and time. But among non-human animals, males are the ones that are flashy and good looking; females tend to be understated and drab. Consider the mane of the lion or the glorious train of the peacock and you get the picture.

But there are, as always, exceptions to the rule. The **Superb Starling** in Africa is one such case in which the lady is quite, well, superb. Glossy iridescent blue with rufous flanks and a shining diamond eye, the Superb gal is just as flashy as her potential mates. I believe it has to do with competitive breeding in cooperative social groups. Some starlings like the Superb have as many as 30 birds in a group, more than half of which are females – which means the girls need to compete to get the males as well!

FICKLENESS

You can't beat guppies when it comes to being fickle, especially in their choice of mate. A female **guppy** will mate with a

male and then, in as little as seven minutes, will be busy on the lookout for another one!

Even more curiously, she will not choose a mate that looks anything like her ex. If you put a female guppy in a fishbowl with any number of males that have the same stripe pattern as the one she just mated with, she circles around avoiding all of them. Put in a male with a different pinstripe and ah, she is interested once again.

So female guppies change their idea of a perfect mate... every seven minutes! Fortunately this fickleness lasts only through the breeding season and not their entire lifespan of about two years.

FIDELITY

Think fidelity and you think of penguins, especially the South American **Magellanic Penguins**, which travel thousands of kilometres in search of food, but return to their mates every year to raise a brood together. The highest recorded period of fidelity in this species is 16 years, of breeding lives that span about 20 years.

Both male and female penguins are faithful; they don't engage in extra-pair copulation (a wonderful biological term that reduces old-fashioned adultery to an academic exercise) like some other birds with lifelong companions – I'm looking at you, swallows and cranes (apologies to folks who swoon over how Sarus Cranes mate for life!)

HOMEMAKER

The female **Baya Weaver** tops my list of non-human homemakers. The poor male has to build several nests – sometimes up to a dozen – before the female will deign to accept him as a mate. And each nest is not just any old assemblage of twigs and moss; it is an elaborate woven grass adobe, with appropriate chambers and an entrance that has to be just right in its length and slenderness. You may think her picky, but the Baya Weaver knows that she isn't just selecting a mate or choosing a nest: she is picking out a home.

And at least she isn't like the fickle female **Bowerbird**, which makes the male build a bower and decorate it with all sorts of blue and flashy objects to woo her – and once mating is done, flies off to make her own nest, leaving him to try and find another female!

MATERNAL INSTINCT

What better mother could one have than the largest being on land, the **elephant**? In the elephant world, the young probably brag about the size of their mommies: "I bet my mommy is bigger than yours," they might say.

Have you seen an elephant herd gathered around a baby? Mothers, sisters, aunts and grannies all come together to envelop the newborn in the greatest maternal blanket of them all. Their legs form a protective circle, their trunks caressing the baby with comforting, soothing touches. And the moment anyone approaches, you get an ear-spreading, screeching trumpet. Approach at your peril, for these females are the epitome of maternal care.

SEXY

There are many contenders to the 'sexy' crown, but presumably a female **praying mantis** is just about the most sexy thing on Earth to a male praying mantis. I believe she must score over all other alluring gals of any species whatsoever.



ABOVE The female praying mantis is a true femme fatale. She makes a meal of her mate once he has consummated the act!

FACING PAGE Elephants epitomise maternal instinct. Infinitely gentle and loving with their young, they are equally fearsome towards anyone who dare threaten their babes.

for which sane-thinking man would jump into bed with a girl who he knows, from biology and history, will end up chewing his head off after mating. (Well maybe I know a few human examples, but figuratively, not literally.)

What makes the male do this is pure sexual allure. What possesses the female to do what *she* does is a matter of debate. Is it that she wants to be the sole possessor of her mate's genes, not allowing any other womb to have that prerogative? Or is it just that after she has had good sex, she gets hungry – and the male, who minutes before was her object of passion, is now reduced to a potentially nice green protein high?

FUNDAMENTALIST FEMINIST

"A woman needs a man like a fish needs a bicycle," Irina Dunn once said (no, it wasn't Gloria Steinem as is commonly believed). **Bonellia viridis**, a sea slug that is rarely known outside the world of marine biology, would seem to agree.

Female bonellias are the only animals I know that have reduced the males in their lives to microscopic status – quite literally. Male bonellias are microscopic and have no brain or heart. They have relatively large reproductive organs and a large sucker, and live (hold your breath) inside the urino-genital system of the female! 'Do what you are meant to do, you sucker,' they seem to say, 'and don't bother pretending the rest of you is of any interest to us.' Ah! The imagery for

some of the more extreme women's libbers out there!

Of course there are many other attributes that I haven't mentioned: 'provider', for instance, which the lioness surely is, going forth to hunt to feed her family far more than any indolent lion ever does. Or 'deceptive', as some female lantern bugs are, colour coding themselves in a way that attracts males of their own species to mate with, and males of other species to eat. Or indeed, 'nymphomaniac', such as the East African topi antelope female, which mates with more than 40 males in succession when in the mood!

Whoever said that women were simple, and why would we want them to be that way? 🐘

The author is a conservationist, writer, photographer and the Executive Director of the Wildlife Trust of India.





A DIFFERENT BEAT

By Akash Bisht and Saurabh Singhai

India's forest service is overwhelmingly a male bastion, but change is afoot – though it moves as yet in halting, fragile, infant steps. An example: the Dudhwa Tiger Reserve, where the administration has employed women from villages around the reserve as forest watchers.

"I used to feel scared when I went into the forest," says Ramkumari, aged 22. "But now I don't. In fact I have grown to like it. I like the quiet of the forest."

Ramkumari is an unmarried undergraduate and hails from village Poya, contiguous to the Chaudhamba Range of Dudhwa Tiger Reserve in Uttar Pradesh. She leaves home by 1:00 pm most mornings, reporting for duty at the range office to deputy ranger (in-charge) Vijay Babudat Singh. By 4:00 pm she is out on patrol, accompanied by other forest watchers. Her beat, a near 20 km, round-

trip through the jungle, covered on foot. On most days she returns home by 7 pm, nearly 12 hours after she left.

FOUR UNIFORMED WOMEN

We first encountered Dudhwa's intrepid women forest watchers on a gloomy November evening last year. We were returning to our field camp after a day's work in the tiger reserve, when we came upon a Forest Department vehicle parked in the middle of a jungle road.

Forest officers were throwing bundles of dry wood into the back of the vehicle.

A seizure of illegally-chopped firewood is not unusual in itself, but we were more than a little surprised to see four uniform-clad women giving instructions to some of the uniformed men. Now that, in the forest service, is unusual to say the least.

One of our team members introduced us to G. Shukla, Deputy Ranger of the Sathiyana Range, who was quite chuffed about the seizure his team had made. We gently broached the real subject of our interest: the women in uniform. "They are part of the Prantiya Raksha Dal," said Shukla. "They now work with



Women forest watchers (above right) inspect the illegally-chopped firewood that they have seized. Having to patrol the forest on foot, these guards brave wild animals such as tigers (left), poachers and local miscreants while on duty every single day. Their diligence ensures that the wild denizens of Dudhwa, like these barasingha (above left), can live undisturbed.

the department as forest watchers on a contractual basis. You see, it is often difficult for our men to deal with the local women when it comes to seizing firewood. But these brave women make our work easy; they are as fierce with women as they are with men – in fact even the local men are terrified of them!”

The four women were introduced to us as Chitravati, Anju Kumari, Ramkumari and (also) Ramkumari. They giggled at the questions we volleyed at them, amused at the degree of interest we were showing about their work.

“Balancing work and family is tough,” Chitravati responded to one of our queries, “especially when you are married. But my husband often says that he is very proud of me. He even brags to his friends about the kind of work I do! And I like my work. It is a very tough job but it also has its thrills.”

FEARLESS, SINCERE, HONEST

‘Tough job’ is an understatement if anything. These women have to patrol the forest on foot, which brings them in contact not only with wild animals, but armed poachers as well as local miscreants who enter the reserve to graze cattle and collect firewood.

“There should be at least one forest guard with us when we are on patrol,” Anju Kumari told us, “but that doesn’t

always happen. Sometimes we catch women cutting down trees, but they threaten us with their axes or knives. We don’t have weapons, not even a stick. We should have some means of self defence.”

Through scorching summers, monsoon rains and winter cold they walk the forest, seven days a week. And since they are employed as daily wagers, on a non-permanent basis, most of them have to wait months before they receive any remuneration.

Still, just a decade ago only about 19.5 per cent of the total rural female population was employed and the proportion of ‘main female workers’, as assessed in 2001, was merely 6.8 per cent. It is heartening therefore to see that of the 52 members of the Prantiya Raksha Dal employed in Dudhwa,

more than one-third are women. That they have made a good fist of it in an entrenched patriarchal culture like that of Uttar Pradesh, enduring the hardships of the job and eking out a living with pride, makes it a worthwhile experiment.

V. K. Singh, Deputy Director of the Dudhwa Tiger Reserve calls it an important effort in making women stakeholders in forest protection: “We should try to accommodate more women in the department,” he declares. “These women are fearless, sincere, honest... and they do not even consume alcohol!”

Akash Bisht is Assistant Manager, Awareness for Conservation at the Wildlife Trust of India. Saurabh Singhai is a wildlife veterinarian with WTI’s Tiger Conservation Project in Uttar Pradesh.

WEARING THEIR HEARTS ON THEIR SLEEVES

The lack of equipment and infrastructure is always an issue for frontline forest staff (both men and women) in India. The Wildlife Trust of India runs a Big Cat Conflict Mitigation Project out of the Dudhwa Tiger Reserve, and Aircel, one of the project sponsors, had sanctioned an additional grant to provide bicycles and winter jackets to the forest guards there. The company generously decided to distribute jackets to all the women forest watchers working in Dudhwa as well, as a token of appreciation for their dedication.

“The jacket helped me a lot during the winters,” Ramkumari tells us. “But more than anything it has the Forest Department logo on it. It gives us a feeling that we belong to the department. It gives us a sense of pride.”



Bird-brained and Proud

In which **Pranav Capila** interviews animal cognition expert **Dr. Auguste von Bayern**, and comes away with a renewed respect for avian intelligence

Nonhuman morality. Interspecies art. PETA and feminism. The politics of primates in Africa. The global 'cowspiracy' of cattle farming. Unusual ideas were brought to a boil in the biting New Delhi air earlier this year at the third Minding Animals Conference, a grand intersection of animal academia and activism hosted by the Wildlife Trust of

Birds have small brains, which people traditionally associated with limited intelligence. However, a bird's brain isn't that small if you factor in the size of its body. A crow, for instance, has the same relative brain size as that of the great apes, our closest evolutionary relatives.

among the first generation of avian cognition scientists (and only incidentally from royalty). I spoke with Dr. Auguste von Bayern under the watchful gaze of some desi crows later that afternoon, to explore the nature and purpose of her research. Here are some excerpts:

LET'S START WITH WHY YOU DO WHAT YOU DO. WHY DO YOU WORK WITH ANIMALS, AND IN PARTICULAR BIRDS? I READ SOMEWHERE THAT YOU RAISED A FLOCK OF GEESE AS A CHILD, AT YOUR GRANDPARENTS' HOME?.

Yes, that's right. I grew up in the countryside and spent much of my childhood outdoors, observing animals. I was allowed to have pets from a very early age and my grandparents showed me how to care for injured wild animals as well. So I took in and fed baby owls, mice, things like that.

One of my first 'official' pets was a baby duck and I went on to raise several ducks and geese. In fact for my final project in school, I followed in the footsteps of Konrad Lorenz, the famous Austrian professor of animal behaviour – I hand-raised five geese from the egg and described their behaviour throughout their development.

Now baby geese will bond with the first moving object they see after they are born, a phenomenon known as imprinting. So these geese were fully imprinted on me and had to go everywhere I went, including school! I even took them into the classroom for a week, after which we were all banished to the school gardens!

YOUR FIELD DEALS WITH THE COMPARATIVE STUDY, ACROSS SPECIES, OF MENTAL PROCESSES ASSOCIATED WITH INTELLIGENCE: ATTENTION, MEMORY, REASONING AND COMPUTATION, PROBLEM

SOLVING... COMPARATIVE COGNITION IS A YOUNG FIELD, AND WORKING WITH BIRDS WITHIN IT IS EVEN NEWER. WHAT DREW YOU TO IT?

Well, I originally wanted to go off to Africa and work more on the conservation side of things. Then I found out that a group was being formed at Cambridge to study the intelligence of corvids. (Commonly known as the crow family, corvids include carrion crows, jackdaws, ravens, magpies, choughs and jays.) I read about it and realised that it was a completely new field of study.

My own experience with ducks and geese had taught me that birds are more intelligent than is commonly believed. And since my grandparents had hand-raised several crows, I knew that they are particularly intelligent birds.

WHAT HAS CHANGED IN OUR KNOWLEDGE ABOUT THE AVIAN BRAIN? WHY SHOULD BIRDS NO LONGER BE CONSIDERED 'BIRD-BRAINS'?

Birds have small brains, which people traditionally associated with limited intelligence. However, a bird's brain isn't that small if you factor in the size of its body. A crow, for instance, has the same relative brain size as that of the great apes, our closest evolutionary relatives.

But even corrected for body size, brain size is just one proxy for intelligence – and it is a crude measure. If you want to be more precise, you could look at particular parts of the brain: in mammals you could consider the neocortex, the area associated with higher cognitive functions. The equivalent area in birds is the forebrain. If you look at the percentage of the neocortex or forebrain compared to the overall brain, you get a better proxy for intelligence.

FACING PAGE *Our last common ancestors lived 300 million years ago, but corvids are at least as intelligent as human toddlers.*

India. A talk on 'Feathered Apes' seemed especially intriguing not just by its title (had Bigfoot been found and was it really a big bird?) but because the speaker, it was whispered to me, was the Princess of Bavaria.

The subject of that dazzling lecture was soon revealed to be the crow family, and the speaker, it transpired, was



A New Caledonian Crow using a stick tool to extract larvae from deadwood.

So you find for instance that the neocortex is much bigger, much more expanded in the great apes than in other animals: much bigger than you would predict given their body size. And the same is true of the forebrain in corvids!

WHAT COGNITIVE PROCESSES PREVIOUSLY THOUGHT TO BE UNIQUE TO HUMANS (AND OTHER APES) HAVE YOU, AND OTHERS IN YOUR FIELD, FOUND IN CORVIDS? Several. There has been an increasing accumulation of such studies in the last 15 years

Let's take, for example, what cognitive scientists refer to as 'mental time travel'. This involves the ability to consciously recollect past episodes from our life – what we call 'episodic memory' – and use that information to anticipate, imagine and plan for future events.

Corvids are interesting to study because they store food, and as a result of this 'food caching' they have not only developed a good memory, but a very good episodic memory.

Mental time travel was thought to be a uniquely human trait. It is a complex skill and we are not born with it; children develop a sense of the future at around the age of two and some planning ability only by the age of four or five

Corvid species seem to exhibit this trait as well. Corvids are interesting to study because they store food, and as a result of this 'food caching' they have not only developed a good memory, but a very good episodic memory. Research on Western Scrub-jays by University

of Cambridge professor Nicola Clayton, with whom I formerly worked, has shown that they can place themselves into a previously experienced situation again – like we do with our so-called episodic memory.

These birds remember exactly what food they have cached, where and when it was cached, and which other birds observed which specific caching event. These memories are then used flexibly, both to guide their recovery of the food caches and to protect their caches from being stolen by other birds

Scrub-jays also seem to be able to imagine future scenarios and plan ahead. In carefully controlled experiments they are seen to store food in places where they have learned there will be no food available the following morning. They also cache a preferred type of food in places where they learn that type of food will not

be available the next morning! (C. R. Raby, D. M. Alexis, A. Dickinson and N. S. Clayton (2007); *Planning for the future by Western Scrub-jays*.)

There are several other behaviours that we study under the umbrella term 'complex cognition'. Tool use for instance.

A LOT OF YOUR WORK AT THE UNIVERSITY OF OXFORD'S BEHAVIOURAL ECOLOGY RESEARCH GROUP INVOLVES THE STUDY OF CROWS THAT USE TOOLS. WHY IS THIS SO IMPORTANT?

Because tool use was thought to be uniquely human until Jane Goodall discovered it in chimpanzees in 1960. It is still extremely rare in animals. And the majority of tool use that we do find is primitive: you have mainly chimpanzees, orangutans and New Caledonian Crows that manufacture complex tools.

I currently work with New Caledonian Crows, which use tools naturally in the wild. In fact they carry their tools along with them when they go out to forage. They obtain a significant proportion of their daily protein intake through this behaviour, so it is scientifically proven that it is highly adaptive for them to use tools. They use twigs, leaves and grass stems to flush out larvae, insects and lizards.

They also manufacture one of the most complex tools of any animal, from serrated *Pandanus* leaves. And tool making is innately a more complex behaviour than tool use, because you have to be able to visualise, to create some sort of inner template of how the finished tool is going to look. You need an understanding of the physical properties of both the tool and its environment – it involves complex physical cognition and reasoning abilities.

The research group that I work with at Oxford, led by Professor Alex Kacelnik, has shown that New Caledonian Crows can spontaneously modify the shape of objects to create functional tools. For example in their natural environment they will create hooked tools, picking up a twig and clipping off all the branches that are not required, bending the twig to create a hook. But in experimental



AUGUSTE VON BAYERN

Corvids typically pair-bond for life and spend hours preening or feeding each other affectionately.

studies they will even bend a wire to create a hook if they are not provided with the right tool. (Weir, A.A.S., Chappell, J., & Kacelnik, A. (2002); *Shaping of hooks in New Caledonian crows*.)

We have recently done several fascinating follow-up studies to that one, where we give the crows different materials to work with, different shapes, and find that they can forge the tools they require for the problem at hand. Such flexibility and innovativeness are key elements of intelligence, and are thought to involve complex cognition processes such as causal reasoning, creativity and prospection.

CROWS HAVE BEEN TRADITIONALLY THOUGHT OF AS INTELLIGENT – AESOP'S FABLE ON THE CROW PUTTING PEBBLES IN THE PITCHER OF WATER COMES TO MIND – BUT THEY ARE ALSO RATHER MISUNDERSTOOD. IN INDIA THE CROW IS THE ONLY BIRD OFFICIALLY CLASSIFIED AS VERMIN. WHAT'S YOUR REACTION TO THAT?

One of the most fascinating, most clever species according to science is considered vermin – that's sad. Contrary to what people think about them, crows are highly sociable. They pair-bond for life and spend hours in

close proximity to their partner, just enjoying each other's company. You can have a far closer relationship with a crow than you can with a dog – and they are far more intelligent than dogs!

Like humans they are extremely long lived, even up to a hundred years. This is an indicator of intelligence because they learn and gain experience over a long period of time, potentially becoming cleverer. And like us they are generalists: very flexible and adaptive, thriving in extremely diverse habitats around the world. That too is a strong indicator of intelligence.

I would encourage people to just observe crows. You know, I talk to a lot of people who tell me, "I saw a crow that put a nut on the rail tracks and waited for a train to come by to crack it." Or that they saw a crow using a piece of bread to fish!

Crows are also very playful; they chase each other in fun, they play with objects... there are many interesting YouTube videos where one can see them surfing down rooftops, rolling in the snow and more.

If we can get people, and particularly children, to observe these things it will open their eyes to how wonderful and fascinating these birds are. They are not vermin! ✖



BIRDING

NOT JUST A MALE BASTION

By Panchami Manoo Ukil

Amateur birdwatchers or birders as we are called, are passionate about looking for as many species we can find to tick off our lists. At a personal level, apart from just revelling in the beauty of birds, the attraction lies in the promise of adventure. Nothing is in control of the birdwatcher when he or she attempts to look for birds in the wild. It is a huge exercise in patience, sometimes rewarding, often not. The adrenaline rush and excitement

for birders lies in this unpredictability of outcome. At a broader level, every birdwatcher is contributing to documenting avifauna through the sheer pursuit of a hobby. Watching birds enables an overall communion with the many facets of nature and the environment. With birds, one looks and appreciates trees, flowers, water, earth, and sky. Hearing and vision are sharpened, and the virtues of patience and tolerance are honed

because birders tread cautiously so as not to frighten the object of their search, or disturb nature's harmony. The birder also gets to observe myriad other creatures in the wild and notices changes in favourite habitats over time. If birds suddenly go missing from an area, it's a warning that something is wrong.

Women birdwatchers have been in the field at least as long as men, though admittedly in fewer numbers. As a

serious birdwatcher for the past three years, my journey has been gratifying in more ways than one. Initially pursuing my passion at a personal level, I soon realised that I could and should play a larger role in creating awareness about birds and their vanishing habitats. Sharing bird images and stories of experiences in the field on social and print media gradually sparked an interest in family and friends, some of whom had no previous idea of the abundance of avifauna in their immediate surroundings.

MY BIRDING FORAYS

My state of Odisha has great antecedents in ornithology, birdwatching, and habitat conservation, with Raja Dr. U. N. Dev being one of the most respected ornithologists in the country, and N. K. Bhujabal known for his sterling efforts in turning Mangalajodi around, from a poacher's den to a birding paradise. Yet there was no regular dissemination of information on birds and bird habitats and no culture of community birdwatching as was the case elsewhere in India. I was inspired to start a bird walk myself (*Sanctuary Asia*, Vol. XXV No. 3, June 2014) in Bhubaneswar only after participating in the 2013 Delhi Bird Race. The Bhubaneswar Bird Walks (TBBW) soon introduced weekly birdwatching in different birding spots in the city. I knew from personal experience that once people began frequenting biodiverse habitats they would understand the ecosystems better and then be more prepared to conserve them. I wanted to draw more people to the magic I knew exists around us.

The response to our Sunday morning bird walks was overwhelming. Soon a surge of birdwatching and the consequent detailed documentation of avifauna took place. Unexplored habitats were unearthed by tenacious birdwatchers and bird photographers, and the list of positively identified species in the city and its environs began to expand. Some birders began to wander further afield, exploring Odisha's rich jungles from where fresh listing of species emerged. This has helped corroborate/supplement past records and highlight the impact of habitat



FACING PAGE The difficult field conditions paled in comparison to the outstanding birding in the Mishmi Hills of Arunachal Pradesh. The author stands front and centre

ABOVE The members of TBBW number almost 100. These hobby birders have been instrumental in documenting the avifauna of Odisha, including birds like this Pale-capped Pigeon

TOP A Cheer Pheasant shows off its distinct, red, eye patch. Vulnerable and elusive species like this, push birders to travel far and wide to add to their 'lifer lists'

degradation on the avians everyone once took for granted as part of Odisha's backdrop. Today there are nearly 100 active birders in our group and they find their own lives enriched, as they enrich our collective pride in the state we love

The Mangalajodi wetland, which sees nearly 4,00,000 winter migrants every year, is now firmly on the

national and global birders' map. Some of the images that extremely proficient bird photographers are obtaining are nothing short of stunning. It's much easier to protect areas that people feel proud of, and what started out as a simple, enjoyable pastime has already turned into conservation action of worth.

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A REWARDING EXPERIENCE

As a woman, I have not faced any insurmountable challenges in the field. The wilderness is full of unpredictable moments, the risks are equal for men and women. At best, the difficulties relate to the physical, in the sense that I do sometimes find it difficult to lug heavy equipment over long distances and rough terrain on foot. But, over time, resilience has been built. Most often, one is so focused on pursuing a passion that one hardly feels the hardships. The support of male co-birders on the field cannot be undermined. Recently I was in the Mishmi Hills of Arunachal Pradesh, which is considered to be one of the toughest birding terrains to traverse. In these high altitudes, the cold and lack of basic facilities like electricity was no deterrent to determined birders. The camaraderie and bonhomie helped me overcome any discomfort that might have crept in and the birding experience proved to be beyond description.

As a woman and a mother, I find extra joy in the fact that I am able to impart knowledge and values to my child on the nuances of nature conservation. Almost by osmosis, our depleting biodiversity has become a family concern. Conservation does begin at home and mothers are best placed to create a whole new generation of 'green warriors' by example, gently inculcating green practices as a way of life for children. I also firmly believe that all children should be exposed to the outdoors to move them away from a cooped-up lifestyle dominated by the hypnosis of gadgets. Through time spent in nature's unstructured playgrounds, they will progressively learn about nature and its complexities, about how important it is to respect and conserve the environment, and what they can do to leave behind the lightest possible carbon footprint.

For me personally, the road map for 2015 is crystal clear. I will make a conscious attempt to take birdwatching to school children so that awareness of natural habitats and the need to conserve biodiversity is instilled at an early age. We are designing a curriculum that includes field trips and classroom interaction at least once a

BIRDS AND OUR ENVIRONMENT

To understand a little more about the intricate relationship between birds and the environment, here is an excerpt from eminent scientist Madhusudan Katti's study on leaf warblers; *These are dull, greenish-brown birds that weigh between seven to 11 grams. They are migratory birds that take over the peninsular forests of India from September to May. They number in billions and probably form the largest avian guild in the subcontinental forests during the tropical winter. Six to eight of these leaf warblers inhabit per hectare of forest. For seven to eight months these leaf warblers spend 75 per cent of their waking hours foraging for insects in the foliage. Each bird eats three insects every waking minute. The prey largely consists of leaf-eating caterpillars. A single leaf warbler therefore eats 180 insects per hour or about 1,980 insects per day, considering an 11-hour working day from dawn to dusk. Thus the six individual birds on a one hectare plot rid the plot of almost 12,000 insect pests every day. Multiply that with the 240 days of their migratory presence and we may begin to appreciate the service they render to our plants. Let us now remove these insectivore birds from the scene. Plants look ragged with tattered foliage, leaves are now packed with anti-herbivore compounds produced in response to caterpillar-nibbling. So now herbivores go hungry, plants make fewer flowers and fruits as they are forced to spend too much energy on self defence thus making frugivores and nectarivores unhappy, regeneration of the forest slows down as fewer seeds get produced and dispersed, ground starts to dry up faster as the canopy is thinner and more sunlight gets in, and the rest of the ecological cascade effects then take over. So this tells us about the important role that birds play in the background of our everyday lives and how much we actually depend on them for our survival.*

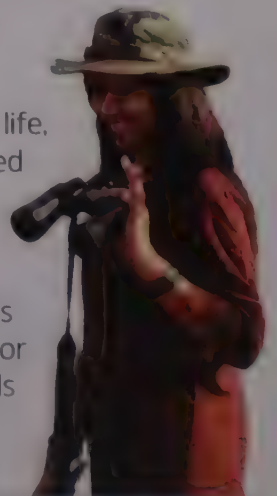
fortnight through a school bird club or nature club. Children will be made aware of and encouraged to think about and express their thoughts and opinions on pressing environmental issues. None of this can or should be enforced... it has to be instilled.

I am often asked – why birds? I recently read excerpts from a book called *Their Fate is our Fate: How Birds Foretell Threats To Our Health and To Our World*. The author, Nobel Prize-winning immunologist, Peter Doherty, asserts that birds detect danger to our health and environment before we do. Observing different species of birds around the world over long periods of time, the scientist concluded that disease and disappearance in bird species serves as an early forewarning about threats to our own health and that of planet Earth. Early man in his intuitiveness regarded birds as sentinels and paid heed to what they considered the 'prophetic capabilities' of the avian universe.

Today, we don't think twice before felling a tree, or using pesticides that end up harming us, together with all other elements of the biota.

We have thus managed to wipe out entire species of birds. Bhubaneswar, for example has virtually no house sparrows. And in Odisha, irrespective of denials, the scourge of diclofenac use in veterinary hospitals, which has almost wiped out India's vulture populations, is still real and present. Conservation cannot be isolated from development and the expansion of infrastructure that humans believe are vital to the quality of life, thus making a balanced developmental strategy all the more imperative.

I want to leave this world a better place for my child. And the birds are helping me to do this. 🐦



Panchami Manoo Ukil is a nature lover and bird enthusiast from Bhubaneswar, Orissa. She is the founder of The Bhubaneswar Bird Walks. She conducts a bird walk every Sunday morning in the city and its outskirts in different avian sanctuaries.

PAMELA GALE MALHOTRA

THE DREAM



A house on a hill overlooking a pond with a river flowing past through a wooded valley filled with wildlife and surrounded by white capped mountains – this was the prophetic dream, so exact in details that I drew a picture of it – a picture of the sanctuary we were meant to create.

Fulfilling that dream took me around the world – from the wooded estates of New Jersey where I played as a child, to the rugged Colorado Rocky Mountains dressed in gold aspen and green pines, to the tranquil waters of Hawaii with its waterfalls and rainbow skies, to the Holy Himalaya with their sacred spaces steeped in tranquility and mysticism – all special places of Nature's glory.

But it wasn't until we came to Kodagu that my dream became reality, SAI (Save Animals Initiative) Sanctuary was established, and I finally found 'home.' SAI Sanctuary now sprawls across 300 acres of restored wilderness in the Western Ghats of Kodagu

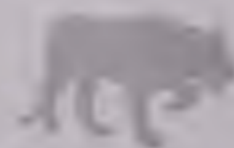
As I write in that house on the hill with the pond and river below, in the valley filled

with wildlife surrounded by mountains cloaked in white shrouds of mist, I reflect on the many lessons learned along the way both practical and spiritual.

Practically, there must be enough land to give refuge to wildlife and enough water to sustain life. You must own the land and not expect governments to protect natural treasures alone, and you must ensure legally that your 'living legacy' continues long after you are gone.

Spiritually, there is an understanding that Nature is our 'true home' and the great healer of life – coming into Nature's heart heals our own, that within Nature there is a secret doorway through which one can pass to experience oneness with all creation – an expansion of heart and soul leading to the realisation of our connection, our kinship with all expressions and elements of life. And finally, believe in your dreams and have faith in the power of Mother Nature to transform dreams into reality

Pamela Gale Malhotra is the heart and soul behind the breathtaking SAI Sanctuary. Pamela is trained in naturopathy and homeopathy, is a Reiki Master Healer and is a passionate advocate for nature conservation.



DEBBIE BANKS



JOANNA VAN GRUIJSEN

I am very fortunate. Everyday I get to do what I have always wanted to do; play my small part in saving the world's remaining wild tigers. I can't imagine a

world where we let these magnificent animals go extinct. In my job, I have seen tiger skins turned into tacky home furnishings, and tiger bones steeped in wine for sale to sleazy gamblers who think it will give them the edge. Tragically, the vehicle of Durga has been reduced to commodities that for some men symbolise power and strength.

IN DEFENSE

Exposing this dark and sinister side of the story; the criminals and consumers, the corruption and incompetence that has led to this sorry state, is what drives me. I have met many inspirational women along the way, from the forests to the corridors of power; brave, determined women who have stood up to greedy domineering forces. They have catalysed change – change in how women are perceived, and change in the world around them.

Debbie Banks is Campaign Leader (Tigers & Wildlife Crime) at the Environmental Investigation Agency (EIA). She oversees EIA's investigations into the illegal tiger trade in China and Laos PDR.



BINA KAK



I developed a closeness to nature in the tiny villages of Rajasthan where I went to school and grew up. Later in life, my post as a Minister for Environment and Forests, gave me the opportunity to strengthen this bond and contribute to wildlife conservation.

Though I am not sure how much I was able to contribute towards conservation, my closeness to wildlife has truly transformed me. Even in this relationship,

Nature has been more giving and more successful – doing more for me than I could ever do for her.

I have learnt humility and realised that Mother Nature does not need us humans. We human beings need Mother Nature to survive. Disregarding, hurting and destroying Nature has and will only continue to harm and destroy us humans. It has become so evident

IN GRATITUDE

to me that what we and our planet need to live peacefully in interdependence, cooperation and love.

For me, wildlife conservation is a training ground to practice these virtues. I am forever grateful to Mother Nature; her forests and wildlife, for giving me a haven to run to and for giving me a passion for wildlife photography. I bow in gratitude.

Congress politician and actress Bina Kak is an erstwhile Cabinet Minister for Environment and Forests. An avid wildlife photographer, her images have been published widely, including in a book she authored on the tigers of Ranthambhore.

INTO THE WILD

BY PRERNA SINGH BINDRA

"My penchant for vanishing into the wilderness goes back a long way. I would have been about seven when I failed to alight from the school bus at St. Ann's Convent (Jamnagar), causing the city police to swing into action (more so as my father was the Superintendent of the district). It was my mother (they do know their children) who eventually found me, well camouflaged behind the bougainvillea in the riotous backyard of our bungalow. Her tears of relief and pent up anger were met with an indignant, "But the peacock laid eggs, I am waiting for the chicks to come out." Was Math, I implied, more important than this momentous event?

Apparently it was, but we will take up that debate another time.

Thus began my journey into the wilds – as a reporter investigating illegal mining, the black market for *shahtoosh*, the poaching of tigers and so on. For one memorable (and explosive) story, I pretended to be a doe-eyed bride-to-be looking for ivory bangles to wear for her wedding, as tradition demanded. I travelled all over Gujarat – including the ancient city of Patan. To my horror, I found plenty, and thus exposed the easy, but illegal, sale of ivory over the counter. Another momentous trip in my early working years was to the Melghat Tiger Reserve. Along with my very first tiger sighting (wow!), I also received my first marriage proposal from a lovely Gond woman, who over a delicious repast – and some *mahua* – offered to pay my family the 'bride price' for her son "who looks like Sunil Shetty".

As an editor of an in-flight magazine, I explored new vistas. While the rest of the gang bagged the so-called creamy junkets, such as trips to Macau and Mauritius, there were few takers for travelling into the hinterland, which fell on yours truly. I wasn't complaining as I charted new territory, meeting the Nocte tribals and the hoolock gibbons (whom they believed to be their ancestors) on the Arunachal-

Myanmar border and visiting the Manas Tiger Reserve, which was on the slow road to recovery after being under siege by militants for over a decade. Manas was a revelation. So ravaged, and yet so utterly beautiful. I remember the burnt skeletons of forest *chowkis*, the fear in the eye of the sambar as it fled at our arrival, the lone tusker whose eyes seemed to tell a million tales. Most of all, I remember this band of brave men – foresters – who continued their vigil in remote locations with no electricity, no means of communication, and stood their ground even as their companions were killed, through the years of militancy. That was the start of my love affair with Manas. I recall sitting by the banks of the Beki river as Great Hornbills flew across, and thinking whatever be the odds, Manas must be saved.

I travelled to 'real' Kipling Country, the Pench Tiger Reserve, which was virtually unvisited then. Pench was magical. Crossing over from Maharashtra to Madhya Pradesh (the tiger reserve transcends both states), I was caught in a deluge that washed away the muddy 'roads'. As I waited in the jeep to be 'rescued', I listened to the hoot of an owl, the occasional alarm call, watched a snake float past... and as lightning flashed, the jungle was alight with hundreds of eyes – a herd of chital. Beautiful.

It was not all smooth sailing though. The budgets were miniscule and the trips bound by tight deadlines. I cursed my colleagues basking in the luxurious hospitality of boutique spas, while I bumped along the non-existent roads of Bundelkhand, Jharkhand *et al*. A particularly frightening incident was arriving at Saranda at midnight to find that the rest house we were to stay in had been burnt down. Saranda is the finest sal forest in Asia, and was under the grip of left-wing extremism. The forests were also pillaged by mining. This is a prime iron ore belt and my heart twisted as I looked at the gaping wounds and the Koina river bleeding red, as it



carried the iron ore residue through the verdant *sal* forest. I exulted when I spied a herd of elephants, then worried about their future. Did they have one at all, with their forest threatened by mining interests? This was over a decade ago, and my fears have unfortunately come true, as government after government has granted leases to various mining giants. Saranda, "a forest of seven hundred hills", and a living university for a generation of foresters, will soon cease to be.

As I evolved as a conservationist, the nature of my forays changed, taking on another dimension. The underpinned purpose now was to assess, understand and try and resolve problems and threats that afflicted forests and wildlife. I traversed the Corbett landscape, initially in a bid to assess the impact of unbridled tourism on wildlife, and then to work out how the forest outside of the tiger reserve could be best preserved for posterity. My time with the elephants there could fill a book. Another glorious forest is the Dachigam National Park, on the edge of Srinagar. On our agenda was to work out a strategy for the revival of the critically endangered hangul. Not only was I fortunate to see a courting couple of the deer, but also surprised a mamma black bear, piggybacking a cub!

I have been blessed to have seen the remotest, and in my eyes, the finest parts of India. There are simply too many memories to recount. I cannot pick a favourite, but there is something special I would like to leave you with: a night spent on a remote beach in Odisha experiencing the *arribada*, the mass nesting of the olive ridley turtles. It was incredible: Thousands and thousands of turtles, their domed bodies glistening in the pale moonlight as they advanced on the beach – sometimes bumping into each other, in their entranced frenzy to find suitable nesting sites. Using their flippers, they laboriously excavated holes to lay their eggs.

Ever so often, they would pause as if to take a breather and gather strength before continuing on their arduous task. Once the funnel-like hole – almost as deep as a bathing bucket – was ready, they dropped the eggs, like shiny, slippery table tennis balls, filled the nest with sand, carefully thumping their bodies, rocking from side to side, and secured their precious cargo. With a multitude of turtles employed in the task, the air filled with an earthy drumming sound. Legend says, and science agrees, that female turtles come back, to the natal beach, where they were born, to create new life.

You know what was even more extraordinary than this spectacular event? The fact that I was right in the midst of it, amongst the turtles, occasionally, absently, bumped by one. A lifetime spent in the forest has taught me that wild animals are wary of humans (but obviously), and usually vanish at our approach. And here I was sitting with the turtles, who were supremely indifferent to my presence. What an honour!

So this is what journeys are all about: unexpected experiences, learning something new. My years of travelling the wilds have enriched me, taught me so much. Most importantly, it has renewed my bonds with the forest. I've learnt that you can leave... but never walk away, from a forest. 🐢



Author, award-winning journalist and passionate conservationist, Purna Bindra has been a member of the National Board for Wildlife and its core Standing Committee, as well as the State Board for Wildlife, Uttarakhand. She is founder-trustee of BAGH Foundation, and edits TigerLink.



The world's last remaining population of brow-antlered deer is confined to a few square kilometres of floating habitat in Manipur's Loktak Lake. Endemic and endangered, the sangai needs managerial interventions. **Cara Tejpal** travels to Manipur in the company of experts to plot the deer's future.

Dr. A.J.T. Johnsingh leans across his colleague Professor Mewa Singh to peer at me. "You know," he says, "When a pack of dholes bring down a stag in velvet, they crunch up its antlers like they're biscuits." Having delivered this piece of trivia he settles back down in his seat and waits as I fumble for an appropriate response. Around us, a platoon's worth of gun-wielding security personnel pace the temporary but beautiful conference hall at the Institute of Bioresources and Sustainable Development (IBSD), where we await the arrival of Okram Ibobi Singh, the Chief Minister of Manipur.

It's a pleasant April morning in Imphal, and I am here on the invitation of the institute to attend a national workshop on the conservation of a benign ungulate species known as the brow-antlered deer or sangai. Just an hour's drive from IBSD, confined to a wretchedly small parcel of unique habitat, lives the last remaining population of these deer in the world. Here, in the 40 sq. km. Keibul Lamjao National Park, this sub-species of Eld's deer *Rucervus eldii eldii* quietly persists even as the threats around them steadily close in. A critically endangered, endemic, large mammal,

you would expect the sangai to feature on the priority list of every government and non-governmental wildlife agency worth its salt, but the species has been largely ignored for decades, overlooked in favour of rhinos, bustards, tigers, elephants and other less endangered but more 'charismatic' animals.

Yet one 'Lone Ranger' has, for close to 40 years, consistently extended a lifeline to the species, while awaiting the awakening of authorities to its perilous status. Dr. M.K. Ranjitsinh hopes that today is that day. In the very first session of the workshop he critiques the population figure proposed by the

What makes the sangai so vulnerable is that it is a habitat specialist. They live exclusively on floating islands of decaying biomass and growing vegetation, known as phumdis, on one end of Manipur's Loktak Lake, separated from it by a mere strip of land.

state. His voice booms across the room. "Please underestimate the population!" he urges. "Ground surveys are not completely accurate. It is better that we err on the side of caution."

Ranjitsinhji has good reason to worry. In 1975, it was he, as India's Director of Wildlife that boarded a helicopter to conduct an aerial survey of Keibul Lamjao and in doing so discovered that poaching and habitat destruction had decimated sangai populations. Only 14 animals remained on earth. Subsequently, the national park was notified, the sangai received much-needed attention, and slowly made a recovery to its present numbers. But then it rapidly faded from conservation discourse. Back in the 70s, the situation was dire, but the threats were more manageable. Today, while the sangai population has risen to just over 200 individuals, the threats have diversified and evolved in complexity.

What makes the sangai so vulnerable is that it is a habitat specialist. They live exclusively on floating islands of decaying biomass and growing vegetation, known as *phumdis*, on one end of Manipur's Loktak Lake, separated from it by a mere strip of land. It is into this lake that the untreated sewage from Imphal city drains. And it is this lake whose hydrology is subject to a game of Russian roulette by the Ithai barrage of the 105 MW Loktak-hydroelectric project ("Is the only purpose of water to provide electricity?" asks Ranjitsinh) that dictates its water levels and therefore the strength of the *phumdis*. It is this lake that is being choked by illegal reclamation. And it is this very lake on which a growing number of Manipuris depend for both fish and wild vegetation.

In the course of her research on the people-park dynamic of Keibul Lamjao in 2008, Dr. Ruchi Badola, a scientist with the Wildlife Institute of India, found that 58 per cent of the people who used the park's resources were entirely dependent on it for their livelihood and that there was a 40 per cent overlap in

the preferred vegetation extracted by the people and deer.

If these stifling anthropogenic pressures were not enough, the sangai, unlike other endangered species, has not even been afforded the luxury of a safety net in the form of a healthy captive population, or a second home. Somewhere along the way of a series of transfers of four deer from the wild to the Kolkata zoo, to the Delhi zoo and back to the Manipur zoo, it is thought that they were crossed with another sub-species of Eld's deer known as the thamin, native to Myanmar and Thailand. With suspicions rife that the existing captive population of sangai is of 'mixed' descent and that too from a miniscule gene pool of just four deer, release into the wild is out of the question. An authority on the captive management of wild animals and a professor with the University of Mysore Prof. Mewa Singh agrees, "Most zoo-bred deer suffer tuberculosis. Our zoos aren't able to keep them free from pathogens and management practices are, for the most part, abysmal. Captive breeding is a science that India has not yet perfected."

But Dr. G Umapathy, a senior scientist with the Hyderabad-based Laboratory for the Conservation of Endangered Species (LaCONES), is more optimistic. Exploring the next frontier in wildlife conservation – conservation physiology, he is brimming with energy as he speeds through his talk, promising that in his laboratory he can unlock infinite secrets from animal faeces. A few samples from the captive sangai are all he needs to determine their 'purity' and ex-situ conservation is not out of the question. "Globally, 19 species, of which seven were extinct in the wild, have been successfully reintroduced," he asserts. It seems that solutions do exist.

The next morning, I find myself in a traditional canoe, being steered by a forest guard through the narrow water channels of Keibul Lamjao. Sitting uncomfortably behind me, umbrella flowering above his head in defense against a persistent drizzle, is Professor Dinabandhu Sahoo, the Director of IBSD. Six months ago when he arrived in Imphal, Prof. Sahoo had never heard of a sangai. As the craft brushes against the surrounding *phumdis* and lurches alarmingly with every pull of the guard's bamboo pole, Prof. Sahoo laughs in self deprecation,



FACING PAGE The unmistakable u-shaped antlers of the sangai stag give it its common name - the brow-antlered deer.

ABOVE The participants of the 'National Workshop on the Conservation and Sustainable Management of the Sangai' pose for a group photo.

COURTESY: INSTITUTE OF BIORESOURCES AND SUSTAINABLE DEVELOPMENT

"They celebrate the Sangai Festival in Imphal. It's not about conservation, but it is named after the deer. When I first heard about it, I thought it was called the Shanghai festival and wondered why we were celebrating a Chinese city! When I finally found out that the sangai was an endemic, endangered species, I conceptualised the workshop and decided that it was time to get things moving."

The Sangai Festival isn't the only thing to have derived its name from this unassuming deer. The newspaper delivered to my hotel room that morning was titled *The Sangai Express*, and scattered across Manipur are towns and villages with names like Sangaikot, Sangaithel and Sangaiprou. The people indisputably share a close bond with the sangai, a fact that reflects brightly in the data collected by, you best believe it, Dr. Sanggai Leima who completed her Ph.D. under the guidance of Dr. Badola. Each member of the 249 households that she surveyed around the national park agreed that protected area status was necessary for the conservation of the deer and a surprising 70 per cent agreed that resource extraction should be controlled.

When we alight from our canoes to begin our ascent to the top of Pabot Hill from where we hope to glimpse the brow-antlered deer, I get the distinct feeling that we are on *terra 'unfirma'*. With each step my feet sink a few inches into the ground and my shoes fill with water. The experience greatly increases my respect for the hooves and gait that the sangai have evolved to allow them unhindered movement on their floating homes and that has given them the epithet, 'the dancing deer'.

In theory, conserving the sangai and its habitat should be profoundly easy. Preserving 40 sq. km. of land and lake are not much to ask for the survival of an entire species, but the stakeholders are so many and so disconnected from one another that in practice sangai conservation is daunting. Between the Forest Department, independent researchers, scientists, the Loktak Lake Authority, local villagers, the National Hydroelectric Power Corporation and the IBSD, suggestions are plentiful but a concerted strategy is yet to materialise. Incredibly, where the tiger and elephant have become money-spinners through tourism, the sangai receive no more than half-a-dozen

DEER COUSINS

Like the sangai, Kashmir's red deer, the hangul, is today restricted to a single, persecuted population in the Dachigam National Park. The 200 odd hangul that remain, face stiff competition from a state-run sheep farm for rights over their grazing meadows. This sheep farm has been illegally operating inside Dachigam since 1978, despite repeated directives from the Chief Minister's office to clear out of the National Park.

The hardground barasingha or swamp deer on the other hand is making a hesitant recovery. In the 1960s, a single population of 66 deer in the Kanha National Park was all that remained. But today, thanks to the determination of good wildlife managers, their numbers have rebounded and seven individuals have been translocated to a new home in the Van Vihar National Park in the interest of maintaining a second, viable population of the species.

visitors a year. An astonishing fact when you consider that they are the last of their kind, persisting on truly one of the most unique landscapes that I have yet had the privilege to visit.

From the top of the hill, the *phumdis* fan out around us like an expansive watercolour. With the ominous grey dome of the sky above us, and the canoes bobbing lazily in the distance, the scene is dramatic. Patiently we wait, and our virtue is rewarded. Amidst gasps of delight a participant's keen eye spots a hind with a young one – two chocolate smears against the jade grass. Ten minutes later on another *phumdi*, a stag appears. Handsome and dignified, it halts in a clearing and turns its impressive U-shaped antlers towards us. It is then that I am hit with the overwhelming knowledge that I am one of just a handful of people to have actually seen a sangai deer in the wild. Sighting a sangai has none of the adrenalin or thrill associated with big cat spotting, rather a simple acknowledgment that the world belongs as rightfully to this stag as it does to you or me.

Even within Keibul Lamjao, the sangai population is limited. Research conducted in the park by Dr. Syed Hussain of the Wildlife Institute of India revealed that only 23 sq. km. of the protected *phumdis* are thick enough to sustain the weight of the sangai, and even so, just eight square kilometres are consistently inhabited by them. The decline of the *phumdis* due to the changing hydrology of the park is a key talking point in the course of the workshop. The reducing thickness and fragmentation of the biomass could mean that one day soon, these floating

meadows will be unable to support the weight of their most precious ward.

As we return to Imphal, we make a pit stop at the side of the road to look out at the populated eastern end of the Loktak Lake. Like a vast, watery acupuncture patient it stretches as far as the eye can see. The surface of the water is peppered with bamboo poles to form *athaphums*, an ingenious local fishing tactic. Picturesque, floating hutments crowd the waters and Prof. Sahoo estimates their number at 1,000 and growing. More huts can only mean more people, and more people can only mean more pressure on the lake and its resources.

Manipur has done a commendable job thus far. For 40 years, with negligible support from outside, the state has somehow managed to secure this tiny population, but current conservation initiatives seem to have stagnated much like the lake. Those who share space with the sangai have been given no incentive to support conservation. Their remarkable tolerance is a product of their own cultural integrity. If Manipur is to save its state animal, it will have to find the political and scientific will to formulate and implement a management plan beyond the tired rhetoric of conference halls. If not, all that will be left for the next generation will be newspapers and towns named for the sangai – hollow tributes to a defeated species. ■



DIA MIRZA



Discovering myself through the wonders of nature is possibly the best gift my parents and school could give me.

I was taught that I was just as much a part of nature as it was a part of me. Even the cobras that lived behind our home were never looked at with fear and we coexisted peacefully. Rock climbing, nature trails, birdwatching, sunrise picnics and learning all the remarkable qualities of nature was a very integral part of my formative years. My father (an industrial designer) would refuse to take on a job offered by any industry that was spewing effluents in a river. He never budged on his principles even if we really needed the money. And my mother? She gifted me the moon one birthday. So yes, just

as much as this Earth is ours, so are the moon and the stars.

As urban dwellers, some of us may not have had the opportunity to discover the wonders of nature. Our fast-paced lives and all the responsibilities they come with most often ensure we don't find time to spend by ourselves in the open, under the sky, watching tadpoles in a tranquil stream, listening to bird song or the rustling of leaves as the breeze gently lifts our spirit. Many of us find that this magical symphony of nature is a luxury that our busy lives cannot accommodate.

In fact, if you were to observe closely you may find that we are actually living our lives, for the most part, in a box. From the cubicles of our work space, to avenues of entertainment that are largely digital, to that lone game of tennis on a clay court at best. This way of life is a risk to health, a sense of community, spiritual growth, a sense of connection to Mother Earth and most importantly a sense of belonging.

NURTURE NATURE

I truly believe that a lot of the damage that we are doing to our environment is because of this disconnect with nature.

It is this very belief that keeps me and fellow nature lovers working doggedly to rebuild a connection between man and nature! A little over two years ago, I decided that I wanted to do more than just raise funds or speak on environmental issues. It was my friend, editor of *Sanctuary Asia*, Bittu Sahgal who gave me the opportunity to become a part of what has now become one of the most meaningful objectives of my life – saving the tiger.

The gaps between human beings and nature will continue to increase if we don't encourage ourselves and our children to go out and discover nature. Our response to nature is instinctual and it helps us discover what it means to be human.

Actress, model and producer, Dia Mirza is Sanctuary Asia's ambassador for the Leave Me Alone campaign and a much-loved supporter of our work. Heavily invested in issues of wildlife conservation, she is one of India's most effective champions of the tiger.

Sanctuary



Entry, 2014 AGNIPRAVA NATH *'The Vanishing Trick'*

THE SANCTUARY WILDLIFE PHOTOGRAPHY AWARDS 2015

CALL FOR ENTRIES

Criteria: Images taken in the wild
that best depict Sanctuary's descriptor:

'CALL OF THE WILD'

Entry, 2014: *The Vanishing Trick* Under the blazing desert sun a Sambar deer from Rajasthan (Rajasthan) disappears into the sand. When threatened, these reptiles vanish then snakes and almost immediately slip out of sight. The photographer, Claudio Tettamanzi, wanted to create this striking image in Rajasthan's Desert National Park.

- Camera-trap, remote-triggered (stationary and moving) images are eligible. Location, date and time must be mentioned, however, the precise location will not be revealed to the public.
- Judges will look for originality, technical quality, subject matter, aesthetics, rarity, mood and action.
- Sanctuary has zero tolerance for unethical practices that put the subjects at risk. No photographs of zoo/captive animals or nesting birds will be accepted. No Great Indian Bustard (GIB) photographs shot after April 1, 2013 are eligible.
- More terms and conditions apply. Submit your entries on www.sanctuaryasia.com, or send them by courier to: Sanctuary Asia, 602, Maker Chambers 5, Nariman Point, Mumbai – 400 021.

1st Prize: Rs. 1,50,000; 2nd Prize: Rs. 75,000; 3rd Prize: Rs. 25,000; Special Mentions: Rs. 2,500 each

Last date for submissions
OCTOBER 15, 2015

ENTER ONLINE NOW: www.sanctuaryasia.com

All entries through the Sanctuary website will receive a free digital Sanctuary calendar.

THE WORTH OF WORDS

Creative pioneer **Ruth Padel** has versatile interests; she's sung at nightclubs in Istanbul and delivered talks on opera for Radio 3, taught Ancient Greek at Oxford University and written a book linking rock music to the heroes of Greek mythology, has been shortlisted for the T. S. Eliot Prize and has served as the Chair of the U.K. Poetry Society – and even as she's ably juggled careers in music, education and literature, she's kept nature as a central theme to her work.

A talented writer of both poetry and prose, Padel's love for the wilds has far transcended perfunctory odes to Mother Earth, and established her as a powerful apostle for conservation. She is on the Council of the Zoological Society of London, a Member of the Bombay Natural History Society, and is a potent communicator of conservation priorities. For her critically acclaimed 2005 memoir, *Tigers in Red Weather*, Ruth spent three years exploring the tiger range countries of India, Russia, China and more, to forge a better understanding of on ground issues and to ultimately produce a book that flawlessly merges the genres of poetry, science, and travel. Her debut novel, *Where the Serpent Lives*, is also set in India's jungles and was published to rave reviews, while her poetry continues to resonate with nature lovers across the globe, and her innovative book of prose and poems on human and animal migration, *The Mara Crossing* (2012), mixes bar-headed geese crossing the Himalaya with migrants from Madhya Pradesh breaking stones for a Mumbai flyover.

The great-great granddaughter of Charles Darwin, Ruth Padel has found herself inextricably bound to the story of the tiger. And both the species and this country, are better for it.

Nature has always inspired great art. On these pages, find a selection of her poems that echo that universal truth.

The Marshes of Eden

*We carry loss with us, as if we'd had a share
in when the world was new – some Garden
we don't know but must be the Home we left.*

*We dreamed of whispering wetgrass, the Everglades
beyond the freeway-turn for Disney World
where we saw through a glass-bottomed boat*

*one manatee afloat; quite possibly asleep.
You were eight, a small girl
laughing in a pedigree Keeshond T-shirt*

*and a tangle-cloud of wild-silk old-gold hair.
Heart like a wheel... The world turns
and I'm bartering in Bombay*

*for your birthday present,
the Goddess of Security,
and dreaming of Al-Qurna triangle*

*where the River Shatt al-Arab is born
and Tigris joins Euphrates, where Eden began
and backwaters melt from the mountains of Iran*

*to glimmer among reclaimed wetlands:
the ancient stopover
for sacred ibis, marbled teal.*

*The Mara Crossing
Chatto & Windus
[2012]*

Creating the Tiger

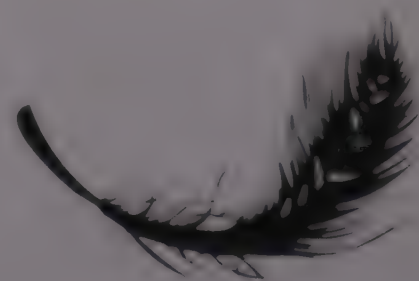
*Before his skeleton and silhouette
defined all epiphanies
which Nature was intending,
from her goodness, to give,*

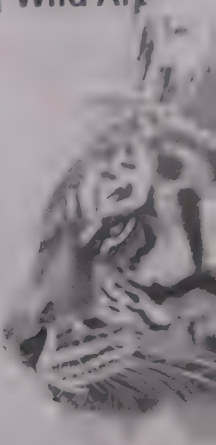
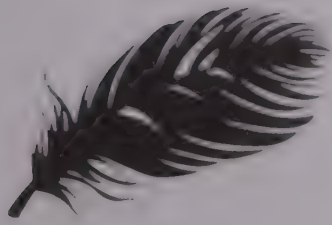
*Nature hesitated, shy.
Small girl alone, untried – new sash,
bruised feet – before her great event.*

*Then Nature loosed the hyoid bone
vibration in tiger's throat.
That voice
re-ordered the course of the world.*

*His tar-flare gaze
took in rivers, high forest,
scribbled pinnacles of rock.*

*The Soho Leopard
Random House U.K.
(2004)*





End of the Line

I am standing at the end of the District Line
beyond Putney Bridge in the Old Store
of the Natural History Museum, a forest
of glass eyes, by giraffe heads mounted on necks
like gingham lilies, each a different length.
The ears fan out for danger like gold leaves
from what had been a stereo of coclia and brain

checking for lion in the gullies.
The highest head, monsieur, is male
watching over his herd from the back
just where Myall's Rules for Flower Arrangement
in the Drawing-Room advise to slot the focal stem.
Behind him, a Hoolock gibbon's shrunken head
and brown eyes under his sad white tiara;

and a wild ass of the Bible. Antelope brows
on mahogany shields, thousands of each species
inscribed with the place and the date
of a hunt. This is the underworld library of death
but you'd never guess. Anyone would take
this warehouse in a side road for a factory,
not the stilly realm where Persephone sits enthroned

and Nature ticks extinction boxes one by one;
Hades arrived at by airlock and a puddle –
a slot for the hoist, which levers giant auroch
or other large latecomers to their last bolt-hole –
whose green water sump-breath wells
into carefully calibrated air
like a rumour of greed in the human soul.

The Mara Crossing
Chatto & Windus
(2012)

Sighting the Tiger

Shitao is famous for pencil-line detail,
for textures. Jianjiang can paint

the inner structure of a mountain.
Both spent half their lives

on Huang Mountain but never caught a flash,
not a molecule, of the divine – that patchwork glow

of a hiding tiger, sizing you up from the shadow
of lemonberry, spiny bamboo.

Working outward
from the self through animals to

the world, you hope to see new truths.
Scaling mountains

where there was no level rock or earth to rest,
pushing through forests thick in thorn

and pulsing undergrowth
where the white-lipped pit viper

curls and sags
on springing leaves –

just the height you might grab, to steady you
in a steep, unknowing place –

I sought to paint
the spirit and will of the tiger.

The Soho Leopard
Random House U.K.
(2004)



RANTHAMBHORE'S USTAD SAGA

A Sanctuary Report

The attack and killing of a forest guard in Ranthambhore, Rajasthan, by a tiger identified as T24, and the cat's subsequent incarceration has created a national uproar on social media. The **Sanctuary Asia editorial team**, with help from **Chandra Rampuria**, auditor, passionate wildlife photographer, and a part of our vibrant conservation network, attempted to condense the over 3,000 posts on this burning issue, a task to which full justice could not possibly be done. However, a complete background is available on www.sanctuaryasia.com and on the Sanctuary Asia Facebook group page.

On May 8, 2015, in a tragic turn of events, a nine-year-old male tiger, T24 (popularly called Ustad) attacked and killed a veteran forest guard, Rampal Saini, who had gone on foot, in the company of two other guards, to check on reports of a tiger in the undergrowth, right next to the main road near the entrance gate of the park. Each year scores of people in India are killed as a result of wildlife interactions gone awry. But this event turned out to be more significant than most others in recent history.

For one, under orders from the Chief Wildlife Warden of Rajasthan, there was an extraordinarily swift response by the Forest Department. Though initially it was presumed that the cat responsible was T72 (Sultan), about 30 minutes after the incident, T24, already under the scanner for three human deaths, was sighted at the exact spot, apparently searching for the body, which had by then been removed. The whole saga started from here. And it opened up massive, emotional debates that polarised wildlife lovers

T24 OR T72?

Doubts on the identity of the tiger that did the killing arose because the territory 'belongs' to T72. Eyewitness accounts of death by tiger attack are rare. Conclusions are arrived at by deduction, knowledge of territoriality and the behaviour of the carnivore in question. *Sanctuary* is not aware whether DNA tests were carried out from saliva traces left on the victim's body, but if they were, then all speculation would be put to rest. In any event, the officers, guards

and field biologists involved came to the conclusion that it was indeed T24 and that given his past record, the tiger posed a clear and present danger to human life, particularly forest guards for whom foot patrols are a daily routine. Another worry was that T24's territory included the route used by thousands of villagers and devotees who visit a Ganesh temple within the Ranthambhore Fort. The Forest Minister of Rajasthan announced that an enquiry would take place, but without making the deliberations of the Committee public, on May 16, the authorities tranquillised and moved T24 to Sajjangarh. Was T24 a threat to human life? Valmik Thapar, Member of the Rajasthan Wildlife Board and a globally renowned tiger expert, said to the *Hindustan Times*: "In my 40 years of experience of Ranthambhore tigers, T24 is the most dangerous one. He killed four people including two forest guards and two locals. The Forest Department and the government of Rajasthan have done a successful job in relocating a man-killing and eating tiger." A Tiger Watch (the NGO started by the late Fateh Singh Rathore) report authored by Dr. Dharmendra Khandal added that T24 appears to have stalked his human victims, killed them with deliberate bites to the neck, rather than merely swatting at them and making good its escape, as most alarmed tigers do if they have no intention to kill. Dr. Ullas Karanth, wildlife biologist and Director, Science-Asia, Wildlife Conservation Society, wrote to *Sanctuary Asia*, saying, "Any tiger that loses its inherent fear of human beings on foot, and displays aberrant behaviour of stalking or attacking human beings should be immediately removed. In my opinion, T24 should have been removed after the very first human attack years ago. Our focus should be saving the tiger as a species and not on saving every individual tiger. Excessive focus on individual tigers while ignoring threats from them to local people and forest staff, will ultimately lead to major loss of public support for our Protected Areas. This has already happened in many places because of both non-removal of aberrant tigers or introduction of tigers that are totally unwarranted based on ecological considerations. We should stop obsessing over T24 or any other

individual tiger and develop a vision for India possessing a tiger population of more than 5,000 wild tigers, rather than half that number we have now. This cannot be achieved if local people do not support tiger-occupied Protected Areas.

Herein lies the wide chasm of disagreement. According to the 'Je Suis Ustad' group fighting to free T24 from 'imprisonment', the veracity of the earlier incidents was never clearly established. They add that T24 never did venture into human territory, nor did he stalk cattle. In their view, all the earlier instances of human deaths were only a natural outcome of humans approaching the tiger too closely. However, given T24's past record, it is difficult to deny that in the right (wrong!) circumstances, he may attack another human being again. Officials and experts opine that four human kills in five years makes it impossible to give the tiger any further benefit of doubt. What is more, the tiger allegedly often went beyond a flash attack and once actually dragged a body some 500 m. away and partly devoured it. The dilemma is where the line should be drawn. Thapar and others say it was drawn after the first two attacks. Others suggest that such arguments are esoteric and removal of the tiger instantly was imperative as no foot patrols were possible and nor could anyone expect villagers not to move about in conduct of their daily lives.

WAS A ZOO THE ONLY OPTION?

In other cases; Karnataka, Corbett, Maharashtra... once declared dangerous to human life, tigers have been shot, after going through carefully laid down National Tiger Conservation Authority (NTCA) protocols and guidelines. Questions have also been raised on the need to relocate T24 to Sajjangarh, a glorified zoo. The very angry group asked why could he not be shifted to either a buffer zone in the Ranthambhore Tiger Reserve or to Sariska, or other similar reserves? A forest official whose service rules do not permit him to speak on the record, told *Sanctuary* that the Sariska authorities refused to accept T24 because they were aware of his propensity to attack humans and this would risk the tentative peace between man and tiger in a reserve where

locals had conspired with poachers to wipe out every last tiger in 2004. Shifting any tiger is an incredibly complex task. Other allied and consequential implications in this case further complicate the matter. T24 is over nine-years-old and his time of dominance and peak health are over. In the area vacated by T24, another male tiger will stake claim and he could threaten the year-old cubs believed to have been sired by T24 with T39 (Noor).

We know considerably more about tiger behaviour than we used to, but not enough to accurately predict behaviour and dynamics. If T24 had been allowed to stay, or if he is reintroduced into the wild on the orders of the court... and another human is killed, the simmering anger against the park promises to trigger an uncontrollable backlash that could escalate into violent conflicts. Such communities have offered safe refuge to poachers who removed more than 20 tigers from Ranthambhore between 2003 and 2005. This is one of the most pressing worries in the minds of those who decided that T24 simply had to be separated from human contact.

A visit to www.sanctuaryasia.com, or the *Sanctuary Asia* Facebook Group will reveal the huge support that this one individual tiger has garnered. Multiple questions kept popping up at multiple times, with multiple rebuttals. While we wait for the courts to decide, the worry is that the incarceration may already have



ABOVE Rampal Saini, a veteran forest guard at the Ranthambhore Tiger Reserve was tragically killed by Ustad while on a foot patrol in the park.

FACING PAGE T24, or Ustad, a legendary Ranthambhore tiger, has become a household name in the country since he was moved out of the park after he killed his fourth human.

SAVING TIGERS IN THE AGE OF SOCIAL MEDIA

Since the incident occurred in the peak of the tourist season, news of the decision to move the tiger out of Ranthambhore became the subject of scathing online debates against the Forest Department, biologists and tiger experts who had taken the decision. Within hours *Sanctuary's* social media pages erupted with comments, statements, and questions from very alarmed and concerned citizens. Though much of the debate has been inflammatory, often targeting *Sanctuary Asia* for not promptly springing to the defence of what tiger lovers call an innocent cat, a good deal of the criticism about the handling of the case was valid and many constructive ideas emerged on how to prevent such incidents from taking place and amending the protocols for the future.

Meanwhile, there is mounting evidence, in the form of images and first-person accounts from very credible sources, that T24's temperament has become unstable. He would be perfectly normal for long stretches, then go through unprecedented bouts of aggression when he encountered people walking alone in his territory. Wildlife lovers point to the absolute right of a wild animal to freedom, but wildlife managers express their inability to take anything other than a precautionary, practical approach to a very emotive issue. *Sanctuary* takes the position that the ultimate decision on T24's future must be left to the Forest Department as they are the ones that have not just the experience, but also the task of protecting tigers ringed by angry and scared human communities worried about risks to their kith and kin. As things turned out, the management took a decision that they say was in the long-term interests of the park, for the conservation of the species as against the welfare of one particular, spectacular tiger. The other issue was that there was staff unrest, with many justifiably expressing their hesitation to return to foot patrol duty while T24 was a continuing threat. They submitted a memorandum to this effect to the Rajasthan Forest Minister. Villagers from Sherpur village also sent a letter to the Forest Department thanking them for agreeing to their demands and taking action immediately. At the time of going to press, the matter has been taken to the Rajasthan High Court with a hearing on May 28, 2015, making it impossible for the verdict to be printed in this issue. However, details will be obtainable online from www.sanctuaryasia.com.

Interestingly, while the media posited this as an animal rights activists-against-wildlife biologists-and-managers issue, *Sanctuary* has a very different take on the 'Return Ustad to Ranthambhore' social media and on-ground campaigns. Apart from Kids for Tigers (*Sanctuary's* Youth Tiger Programme), no significant groups had ever taken to the streets in defense of the tiger. In the case of T24, thousands of cyber warriors made their anger and angst very public. Within days, the national and international media picked up their story. Yes, bitter exchanges took place, but overall we see this episode as one of the most positive recent developments for tiger conservation. We believe that the sheer energy and motivation of people can and should be harnessed for the huge battles that lie ahead. This involves forcing the Indian government to desist from destroying tiger habitats by pushing mines, roads, dams and other commercial infrastructures not just in Ranthambhore, but across India's remaining wildernesses. Hopefully when the dust settles, all sides of the divide will mend fences, keeping in mind that their differences lay over the perception of whether or not T24 was dangerous and whether or not he should have been allowed to stay where he was. Neither side can hope to ignore, or undermine the importance of the other. Sentiments aside, however, experts and hands-on managers have inspected graphic evidence, some of it having made its way to social media pages, demonstrating that T24 had indeed killed and eaten some of his victims. Expert opinions state unambiguously that this tiger, love him or hate him, has the propensity to kill again.

By procedure the final call on such matters lies with the state Chief Wildlife Warden, who must work with the National Tiger Conservation Authority and local experts with first-hand experience on the ground in Ranthambhore. If such advice were to be ignored and the tiger ended up killing another human then who would ultimately have to wear the crown of accountability? *Sanctuary Asia* has always advocated that the precautionary principle prevail and that while nature conservation takes root in the heart, it must eventually be guided by the head.

A TIGER CALLED USTAD

One of three cubs born to the tigress known as the Lahpur-Nagdi female and presumably a male tiger known as Jhumaroo. Ustad is a direct descendent of Machali – perhaps the world's most famous big cat (See *Sanctuary*, Vol. XXXIV No. 2, April 2014). The three siblings, T23, T24 (Ustad) and T25 (Dollar) grew up in the Lahpur-Nagdi area before dispersing to establish their own territories. Ustad went on to dominate the Chidi Kho valley of the Sawai Mansingh Sanctuary that lies immediately south of the national park. In 2010, when the tiger T12 was translocated to Sariska, T24 took over his territory and became the dominant male of the Sultanpur-Phoota Kot area. In his lifetime this male had already been tranquillised three by the Forest Department. First, to be radio-collared, then to have a thorn removed and again, to treat a life-threatening stomach ailment. May 16, 2015, eight days after killing Rampal Sami, was his fourth tranquillisation experience. This could have been an attempt to avert unpredictability and make any further interaction with humans extremely risky.

damaged T24's ability to return to his old life in Ranthambhore.

COMMUNICATION FAILURE

In *Sanctuary's* opinion, the entire episode was poorly handled from the communications point of view. We advocated, before T24 was removed, that a public statement from the Office of the Chief Wildlife Warden be issued. We also suggested that T24 be satellite collared and monitored and that all pedestrian traffic to and from the park gate and the fort be curbed, while an empowered committee go into the business of what should be done about T24. At the very least an official press release should have been issued, explaining the steps taken, the rationale, and the state of health of T24 in Sajjangarh. In the absence of credible information, all manner of assumptions were made and reproduced in both the national and international media, through the Internet and also through television channels such as NDTV and BBC. The people who champion T24's freedom are angry that their queries and genuine concern for the fate of the cat fell on deaf ears. Because they live far from the park, they strongly articulated, did not mean they had no right to be informed about the matter. They also questioned the haste with which the operation was carried out. To be fair, however, if a cat is believed to be dangerous to human life, no wildlife manager can reasonably be expected to postpone taking action. Of course only after taking care that protocol is followed in letter and spirit. Hopefully, this experience will spur government and the NTCA to revisit protocols for ground action when similar occasions arise in the future. The T24 case should also teach the system the importance of a public communications protocol to be applied in emergency situations. Communications with villagers, department staff, and the interested public, without whose help conservation plans would have little hope of being implemented effectively by the political system of any nation, is imperative.

What now? Well there are two options. Three really, if the court orders that dice be played with the lives of people who cross the path of a tiger



An iconic file photo of Ustad (above) that went viral recently, shows him curiously inspecting an abandoned forest checkpoint. He has a veritable fan club that is extremely upset because the Ranthambhore authorities shifted him out of the park, believing he posed a real and present danger to humans.

judged to be dangerous and it is released back into the wild. 1. T24 stays in captivity in a zoo. 2. He is released into a much larger enclosed area with simulated quasi-natural conditions and closely observed. 3. He is released in Ranthambhore, but collared and carefully monitored. It is the Forest Department, headed by the Chief Wildlife Warden of the state, the NTCA and their advisors, who are empowered to take a call on which of the three options should be taken. But what seem to be small local matters are no longer small... or local. The Internet has brought down governments. Dismantled the cosy partnerships between big business and big media. And helped India's Prime Minister come to power in the largest democracy in the world. There is an air of openness and free access to information that simply will not, indeed cannot, be bottled up any longer. Not anywhere in the world. Here are some outcomes that *Sanctuary Asia* would like to see emerge from the very traumatic T24 episode, which may benefit not only the tiger, but all of our wildlife and our wilderness areas. 1. Broader level national protocols on how such conflicts should be handled in the future. 2. A planned programme to minimise dangerous carnivore-human interface. As an example a free shuttle bus between the park entrance and the Ranthambhore Fort, a route taken by thousands of people each year. 3. Vastly-improved physical and political support for our forest guards including equipment and training to better handle man-animal problems. 4. A revamp of the very confused and frankly ineffective tourism policy that the NTCA forced on all tiger

reserves. (The final draft was altered by the the-then Member Secretary, after it was signed by the Chairman and approved by members of its own Ecotourism Policy Drafting Committee.) Another important perspective in this story relates back to the source of tiger-human conflicts. Encroachment by humans is nibbling away buffers of Protected Areas. The area each tiger needs depends on prey abundance, the availability of water and cover, the degree of isolation and effectiveness of protection. Even if tiger populations rise in the relatively small core areas designated for them, the fact is that the buffer forests surrounding such areas are in steep decline on account of parallel human developmental pressures. A resolution of this inherent conflict, therefore, becomes the most fundamental issue. For any wildlife conservation effort to work, it is important that a fair balance be maintained between wildlife considerations and human considerations. Conservation efforts can only succeed if this equilibrium is established. 🐅

We realise that neither those asking for T24 to be shifted out, nor those asking for it to be left alone to live out its natural life in the wild will be satisfied with this honest attempt to share their views. We therefore asked for help from an independent auditor to read through and help put this text together. We have also created a page on www.sanctuaryasia.com where readers can follow the chronology of this conversation and its complexities, and add their own thoughts. – Ed.



FEEDING THE WORLD

Women and biodiversity

By Vandana Shiva

The two great ecological challenges of our times are biodiversity erosion and climate change. And both are interconnected, in their causes and their solutions.

Industrial agriculture is the biggest contributor to the above mentioned challenges. According to the United Nations, 93 per cent of all plant variety has disappeared over the last 80 years. Monocultures coupled with chemical inputs do not merely destroy plant biodiversity; they have also destroyed soil biodiversity, which leads to the emergence of pathogens, new diseases, and more chemical use. Our study of soils in the Bt-cotton regions of Vidarbha showed a dramatic decline

in beneficial soil organisms. In many regions with intensive use of pesticides and GMOs (genetically modified organisms), bees and butterflies are disappearing. There are no pollinators on Bt-cotton plants whereas the population of pollinators in Navdanya's biodiversity conservation farm in Doon Valley is six times more than in the neighbouring forest. The United Nations Environment Programme has calculated the contribution of pollinators to be \$200 billion annually.

Industrial agriculture also kills aquatic and marine life by creating dead zones due to fertiliser run off draining into waterbodies. Pesticides are also killing or damaging aquatic life.

Besides the harm to biodiversity and the climate, industrial agriculture actually undermines food and nutrition security. Firstly, industrial agriculture grows commodities for profits of the agrichemical (now also biotech) and agribusiness corporations. Only 10 per cent of the GMO corn and soya goes to feed people. The rest goes towards animal feed and biofuel. This is clearly not a food system that feeds the world.

Secondly, monocultures undermine nutrition by displacing the biodiversity that provides nourishment and the diversity of nutrients our bodies need. Herbicides like Roundup do not just kill the milkweed on which the monarch butterfly larvae feed, they kill sources of nutrition for humans

– the amaranth, the *bathua*, and mixed cropping produces more nutrition per acre than industrial monocultures.

Having destroyed our sources of nutrition by destroying biodiversity, and creating vitamin A, iron and other deficiencies, the same companies which created the crisis are promising a miracle solution: GMOs. Genetically engineered golden rice and GMO bananas are being proposed by corporations hiding behind the cloak of academia as a solution to hunger and malnutrition in the Global South. But these are false miracles. Indigenous biodiverse varieties of food grown by women provide far more nutrition than the commodities produced by industrial agriculture. Since 1985, the false miracle of golden rice has been offered as a solution to vitamin A deficiency. But golden rice is still under development. Billions of dollars have been wasted on what can best be described as a hoax. On April 20, 2015, the White House gave an award to Syngenta, which has tried to pirate India's rice diversity, and owns most of the 80 patents related to golden rice. This is reminiscent of the Emperor who wore no clothes. Golden rice is 350 per cent less efficient in providing Vitamin A than the biodiverse alternatives that women grow. GMO 'iron-rich' bananas have 3,000 per cent less iron than turmeric and 2,000 per cent less iron than *amchur* (mango powder). Apart from being nutritionally empty, GMOs are part of an industrial system of agriculture that is destroying the planet, depleting our water sources, increasing green houses gases (GHGs), and driving farmers into debt and suicide through a greater dependence on chemical inputs. Moreover, these corporate-led industrial monocultures are destroying biodiversity, and we are losing access to the food systems that have sustained us through the ages. Biodiverse ecological agriculture in women's hands is a solution not just to the malnutrition crisis, but also the climate crisis.

Women have been the primary growers of food and nutrition throughout history, but today, food is being taken out of their hands and substituted by toxic commodities controlled by global corporations. Monoculture industrial farming has taken the quality, taste and nutrition out of our food.



FACING PAGE Women work the fields on Navdanya's organic farm in the Doon Valley.

ABOVE Biodiversity exists in agriculture too, as showcased by this display of indigenous rice varieties.

In addition to destroying biodiversity, industrial agriculture is the biggest contributor of GHGs that are spurring climate change and leading to climate chaos. As I have written in my book, *Soil, Not Oil*, 40 per cent of GHGs – CO₂, nitrogen oxide and methane, come from industrialised globalised agriculture. And chemical monocultures are also more vulnerable to climate change as we have witnessed during the unseasonal rains at harvest time this year.

On the other hand, organic farming reduces emissions, and also makes agriculture more resilient to climate change. Because organic farming is based on returning organic matter to the soil, it is the most effective means to remove excess carbon in the air, where it does not belong, and put it back in the Earth, where it should be. Navdanya's research has shown that organic farming has increased carbon absorption by 55 per cent. International studies show that with two tons per hectare of soil containing organic carbon, we can remove 10 giga tons of carbon dioxide from the atmosphere, which can reduce atmospheric pollution to 350 ppm.

In addition, organic matter in the soil also increases the water-holding capacity of the soil, reducing the impact of floods and droughts. A one per cent increase in soil organic matter can increase soil water holding capacity by as much as 1,00,000 litres per hectare. Five per cent can thus increase it to 8,00,000 litres. This is our insurance against climate change, both when there is drought and too little rain, and when there are floods and excess rain. On the other hand, cement and concrete increases water runoff, aggravating floods and drought. We witnessed this in the Uttarakhand disaster in 2013 and again in the Kashmir disaster in 2014.

At harvest time of spring 2015, India had unseasonal rains which destroyed crops. More than 100 farmers have committed suicide. Climate instability adds to the burden of debt the farmers are already carrying on account of the rising costs of production and falling prices of produce. Both the crisis of debt leading to climate change and the climate crisis have a common solution – a shift to biodiverse ecological agriculture, which is free of high cost chemical inputs and dependence on corporate seeds, thereby providing freedom from debt. This kind of agriculture has in-built climate resilience through biodiversity and organic soils.

4,000 years ago the teachings of the Vedas guided us and we might do well to heed by it:

"Upon this handful of soil our survival depends. Care for it, and it will grow our food, our fuel, our shelter and surround us with beauty. Abuse it, and the soil will collapse and die, taking humanity with it." 🦋



Dr. Vandana Shiva is the Founder of Navdanya, an organisation, dedicated to conserving biodiversity in agriculture. She has a PhD in physics and did her PhD on *Hidden Variables and Non-locality in Quantum Theory*. Author, activist, feminist and public speaker, she has received many awards including the Alternative Nobel Prize, the Sydney Peace Prize, and the Fukuoka Award.



FROM THE HILLS OF THE HIMALAYAN LANGUR

BY HIMANI NAUTIYAL

"**D**anda ma gham acheji, tese pela siyodu chaliyiyan" (go to bed, before the sun's rays leave the highest peak) – is an old Garhwali saying from the near mystical hamlets nestled in the folds of the great Himalaya that truly reflects the danger of living in big cat country as told in Jim Corbett's *Man-eaters of Rudraprayag*

MY TEACHER IS THE HIMALAYA

Born in one such little village of Rudraprayag, surrounded by forests,

I grew up in awe of nature – my childhood laid the foundation stone for my attachment to the wild. And my childhood fear of the unknown was transformed into curiosity for the new. It is the Himalaya that gifted me my interest in wildlife. To pursue this passion, I took up Forestry for my B.Sc. degree and was gradually drawn to animal behaviour, especially that of primates.

Drawn by fond memories of my childhood, I always wanted to return

to work in a remote village of the Himalaya. And there could be no better option than Mandal, a sleepy little village at the base of a steep valley, leading towards the Rudranath peak of the Garhwal Himalaya. It is here, in Garhwal in 1974, that the local women blessed the world with the 'Chipko Andolan', the non-violent resistance against the timber mafia, through the act of hugging trees. Steeped in history and representing one of the many villages that skirt the fringes of the Kedarnath

The Himalayan climate is altering rapidly due to the effects of global warming and it is important to learn how these primates adapt themselves to unpredictable weather over the long-term in order to know how to conserve this species and its habitat.

Wildlife Sanctuary, Mandal proved to be an ideal base for my field work.

A GOLDEN OPPORTUNITY

An Indian Academy of Science fellowship gave me the golden opportunity to study central Himalayan langurs and to understand the interface between them and humans, under the guidance of the highly-respected primatologist, Prof. Anindya Sinha. I started my research in langur behaviour in two different habitats, one inside the Kedarnath Wildlife Sanctuary and the other close to Mandal village.

The central Himalayan langur *Semnopithecus schistaceus* is among the least-studied primates in the world and there is very little knowledge about their behaviour and ecology. My preliminary study lasted just two months, which was not nearly enough time to start to unravel the mysteries these primates hold. I yearned to learn more about their behaviour across the broad altitudinal range of the Himalaya. Opportunity smiled on me in the form of a grant from the Rufford Small Grant Foundation and I got to study, in depth, the central Himalayan langur, the only primate species found up to an elevation of 4,500 m. in the Himalaya.

SURVIVAL

My goals for my current study are to find the different strategies these langurs use across their wide altitudinal range (1,500 to 4,500 m.) to survive in these harsh environmental conditions. The Himalayan climate is altering rapidly due to the effects of global warming and it is important to learn how these primates adapt themselves to unpredictable weather over the long-term in order to know how to conserve this species and its habitat.

To make matters more complex, the people living in these remote Himalayan villages, like the one where

I grew up, are facing problems of crop raiding by langurs. Because these villages are located on the periphery of the sanctuary, human-wildlife conflict is quite high. The Himalayan black bear, wild pig, rhesus macaque and central Himalayan langur are the species primarily responsible for crop damage. Villagers are also losing their cattle, sheep and goats to leopard predation.

Though agriculture is the primary form of livelihood in the region, farming alone is not a sustainable source of income, so it is supplemented by the sale of milk. Due to the need for fuel and fodder, women, from the ages of eight to 80, regularly venture into the furthest reaches of the forest. Conflict between humans and bears is increasing alarmingly – and lives are being lost in the form of people, livestock and wildlife in the bargain. To better understand langur and human interaction and to mitigate these problems, I am interviewing local people in search of new ways to deal with this escalating issue.

BEAUTIFUL BONDS

If you ask me, what is the most beautiful species of the Himalaya – I will unflinchingly nominate the central Himalayan langur.

Theirs is a multi-male dominated society. Each troop has five to six adult males who share responsibilities for the welfare of the troop. Females usually spend more time with other closely related adult females, sub-adults and juveniles and sub-grouping is a common feature.

Infants depend on their mothers up to the age of one-and-a-half years and watching them in their growing months is riveting. Just like children in kindergarten, they spend most of the time in a play group. The fascinating part about their behaviour is the selection of the same play sites. Inside the troop's territory at each feeding site, the infants have almost two or three designated playgrounds. But unlike human children, langur young are disciplined and systematic. They follow rules even while playing. Swinging and jumping are very prominent play



FACING PAGE From an outcrop on the mountainside a troop of central Himalayan langurs surveys a field in Mandal village.

ABOVE A juvenile (left) and two infants survey the photographer with characteristic primate curiosity. The author notes that their play behaviour is both enchanting to watch, and disciplined!

ABHIJIT DEY

Unlike human children, langur young are disciplined and systematic. They follow rules even while playing. Another striking behaviour is their tendency to form a queue. Sometimes they are joined by juveniles and sub-adults. Their antics are hysterical, and I'm constantly entertained in their presence.

behaviour. They start by running up onto a large branch of their favourite tree that generally makes a certain angle with the slope. They then move out and swing on a smaller branch of a certain height and jump to flatter ground, before starting all over again. Another striking behaviour is their tendency to form a queue. Sometimes they are joined by juveniles and sub-adults. Their antics are hysterical, and I'm constantly entertained in their presence.

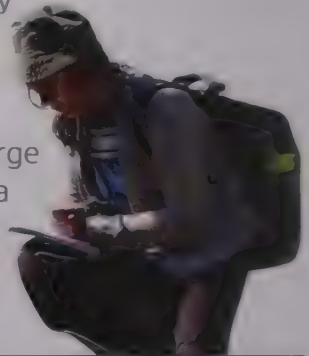
Infants depend heavily on parental care in the early stages of their lives. Mothers make every effort to care for their newborns during the first five to six days. Caring deeply for the infant, the mother spends very little time feeding or grooming herself.

All adult females in the same closely associated family sub-group help the mother in child rearing. For example, they will carry the newborn when the mother goes off to feed or to spend some time grooming with the others. Adult males are especially protective of adult females with young. In order to survive in this environment, the group members must look out for each other.

UNCERTAIN BUT HOPEFUL

Though, while writing this article, I am miles away from my field site, embroiled in paper work; part of me still resides there, watching over the gambolling infants! With almost three newborns in each troop that I am studying, growing up in parental care, I am hopeful that they will beat

all odds, challenge all uncertainties and will survive the ever-burgeoning anthropogenic pressure. I am hopeful that human greed won't consume their few needs. I worry for my troops, but I always remember the words of Dr. George B. Schaller, "I am a conservationist. I cannot afford to lose hope."



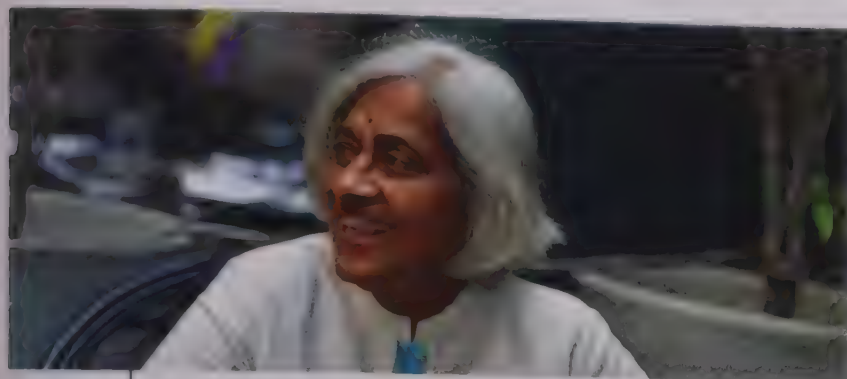
Interested in the behavioural ecology of primates and human-non human primate interconnections in the higher Himalayan regions, Himani Nautiyal is pursuing Masters in Wildlife Biology from A.V.C College, Tamil Nadu

HIMANI NAUTIYAL



This large family of langurs may paint a pretty picture but they are in the midst of raiding a mustard field. Conflict due to crop deprecation is an urgent issue that affects the people-wildlife dynamic in these Himalayan villages.

USHA RAMAIAH



My mother, an enthusiastic gardener who loved everything about nature, opened my eyes to the wonders of the natural world - from beautiful flowering plants and trees, birds nesting in our garden, and the mongoose playing with its young ones, to the bees carrying nectar and pollen to their hives within our own compound.

Later, exposure to Girl Guiding in my school days drew me to camping, mountain climbing and trekking. It enabled me to pursue my interest in birdwatching and photography.

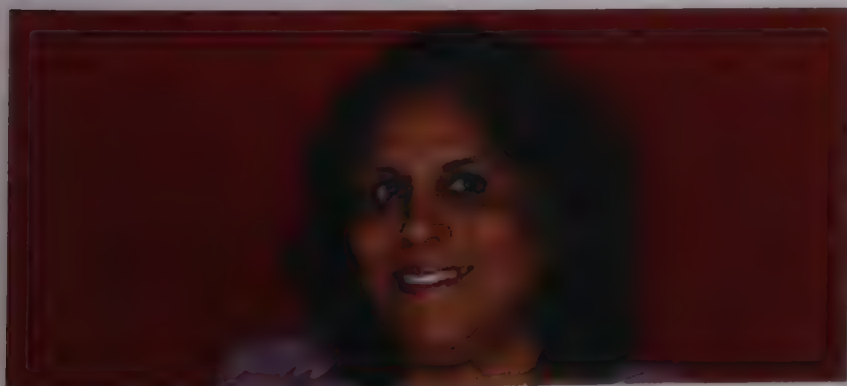
It is thus, when a girl in her youth is exposed to nature's many miracles, like the exquisite sight of fireflies on a dark night, the sun's rays on snowy peaks or tiny plants making their appearance soon after the snow melts, that she will find inspiration not only for herself but also for her children to conserve the preciousness of wild nature.

This bountiful Earth, with all its miracles, is there for all of us to sense, experience and enjoy. We are all blessed to live on such a land. I am hopeful that our young women will carry on the baton of conservation through their children so the generations to come, may in turn love and care for Mother Earth.

THE MIRACLES OF NATURE

Usha Ramaiah bats for the tiger. Coordinator of Kids for Tigers in Bangalore, she guides and encourages teachers and children to learn about, and from, nature. A founder-member of the Karnataka Mountaineering Association, mountaineer, birdwatcher and animal activist she continues to embark on short treks even at the age of 70, and says she enjoys birding and nature walks even more today than she did in her youth!

MADHU BHATNAGAR



Our elders always told us that nature was the best teacher, but as children we rarely took the time to ponder the thought.

Yet, as I grew older and more observant, I found that everything humans thought to design - nature had already designed better. Such wondrous adaptations abound around

us - waiting to be imitated. Surely biomimicry should be taught in schools.

But till we can propose radical changes in school curriculum, the task at hand remains to ignite the innate sense of wonder for the natural world that dwells in every child through unstructured play in the Great Outdoors.

Though it is unscripted in our job profiles, I am firm in my belief that it is the duty of educators to allow uninterrupted time with and in nature to children. It is here that they will learn what no book can ever teach.

NATURE SCHOOLING

An artist in her own right, Madhu Bhatnagar believes a child's mind is a canvas. As the Deputy Head of The Shri Ram School, Vasant Vihar, New Delhi, she had charted out an Environment Education Policy for the school and has been working relentlessly to breathe the spirit of conservation into her students.



The Sanctuary Wildlife Awards were instituted in the year 2000 to recognise and draw national attention to the contribution of individuals working for the protection of wildlife and natural habitats in India. We invite nominations and entries from Sanctuary readers, which should be sent to reach us no later than **October 15, 2015**. Send entries to: Sanctuary Wildlife Awards 2015, 602, Maker Chambers V, Nariman Point, Mumbai 400021. E-mail: admin@sanctuaryasia.com

Lifetime Service Award

Criteria: An individual whose life has been devoted to the protection of wildlife species or their habitats on the Indian subcontinent.

Award: Rs. 1,50,000

We are in search of a true hero; someone whose life's purpose and respect for nature can be held out as an inspiration to the youth of India.

Wildlife Service Award

Criteria: Individuals currently working in the field who have displayed extraordinary courage, dedication and determination in the arena of wildlife conservation.

Five Awards: Rs. 50,000 each

We are in search of inspired wildlifers, forest employees, researchers, villagers or anyone currently involved in nature conservation in the field who have set personal standards for others to follow.

Nomination Form Lifetime Service Award

Name of candidate: _____

Sex: M/F Age: _____ Occupation: _____

Place of work: _____

Address: _____

City: _____ State: _____ Pin: _____

Tel.: _____ E-mail: _____

Proposed by: _____

Occupation: _____

Address: _____

City: _____ State: _____ Pin: _____

Tel.: _____ E-mail: _____

Signature: _____ Date: _____

Seconded by: _____

Occupation: _____

Address: _____

City: _____ State: _____ Pin: _____

Tel.: _____ E-mail: _____

Signature: _____ Date: _____

What qualifies your candidate for the Award? (attach sheet)

Nomination Form Wildlife Service Award

Name of candidate: _____

Sex: M/F Age: _____ Occupation: _____

Place of work: _____

Address: _____

City: _____ State: _____ Pin: _____

Tel.: _____ E-mail: _____

Proposed by: _____

Occupation: _____

Address: _____

City: _____ State: _____ Pin: _____

Tel.: _____ E-mail: _____

Signature: _____ Date: _____

Seconded by: _____

Occupation: _____

Address: _____

City: _____ State: _____ Pin: _____

Tel.: _____ E-mail: _____

Signature: _____ Date: _____

What qualifies your candidate for the Award? (attach sheet)

Guidelines: Nominations must be kept confidential from the candidate. • Nominations must be proposed and seconded by individuals/organisations who know the candidate well.

• A brief note, around 300 words, on the achievements that qualify the candidate for the award should be attached along with a biographical note (around 250 words) and photographs of the candidate at work. • Details of specific instances/examples demonstrating the candidate's commitment together with details of the issue he or she is tackling. • Press clippings, published material if any, on about the candidate or the candidate's work. Any other supporting material for the benefit of the judges.

Green Teacher Award

Criteria: An individual currently working to communicate wildlife and conservation values to students in Indian schools or colleges

Award: Rs. 50,000

We are in search of an individual with a missionary zeal who is setting an example for other teachers to follow. Creativity, leadership qualities and a proven track record of working with young persons in a rural or urban setting is imperative.

Green Teacher Award Nomination Form

Name of candidate: _____

Sex: M/F Age: _____ Occupation: _____ Place of work: _____

Address: _____

Tel.: _____ E-mail: _____

Proposed by: _____ Occupation: _____

Address: _____

Tel.: _____ E-mail: _____

Signature: _____ Date: _____ Seconded by: _____

Address: _____

What qualifies your candidate for the Award? (attach sheet)

Guidelines for Green Teacher Award: ● Nominations must be proposed and seconded by individuals/organisations who know the candidate well. ● A brief note (around 500 words) on the achievements that qualify the candidate for the award should be attached along with a biographical note (around 250 words) and photographs of the candidate at work.

● Any other supporting material for the benefit of the judges.

Young Naturalist Awards

Criteria: Individuals between the ages of 16 and 25 on January 1, 2016, who show extraordinary caring and respect for nature.

Three Young Naturalist Awards: Rs. 20,000 each

We are in search of young naturalists or conservationists, for whom the study and defence of nature is the purpose of life, whose actions speak louder than words and who inspire hope for the future.

Young Naturalist Awards

Name: _____ Age: _____ Address: _____

Tel.: _____ E-mail: _____

Proposed by: _____ Address: _____

Tel.: _____ E-mail: _____

What qualifies your candidate for the Award? (attach sheet)

Wind Under the Wings Award (Rs. 25,000)

Criteria: An Indian organisation that has supported an individual who has made a difference. We are in search of an institution that encourages naturalists, conservationists, journalists and/or other professionals to defend nature by making resources available and by providing the intellectual space for people to follow their dream. Attach a separate sheet with details of the organisation and its work.

All awards are subject to the following conditions

The contest is open to everyone except Sanctuary, DSP Blackrock and Deutsche Bank employees, or those directly associated with the organisation of the contest. The winners will be chosen by a panel of judges, appointed by Sanctuary magazine, whose decision will be final. In the event that entries do not meet the judges' standards, the organisers reserve the right to refrain from making an award.

Call of the wild
Sanctuary
A S I A

SUBMIT YOUR NOMINATIONS ONLINE NOW:
www.sanctuaryasia.com

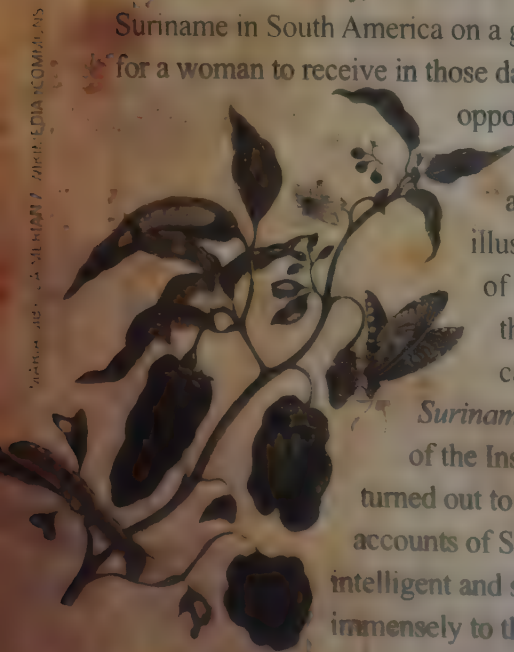
THE SANCTUARY PAPERS

TEXT BY PURVA VARIYAR

MARIA SIBYLLA MERIAN (1647 – 1717) – RENOWNED
NATURALIST, SCIENTIFIC ILLUSTRATOR

Almost three centuries ago, was born one of the world's first entomologists – Maria Sibylla Merian. Her passion for insects changed science forever. The beauty and intricacies of the lifecycle of butterflies, moths and caterpillars captured her imagination by the time she turned 13. By then, she had already keenly observed the metamorphosis of a silkworm. Her observations and highly detailed and accurate illustrations of plants and insects, in the various stages of their life cycle were highly regarded. She became near obsessed with the transformations and metamorphosis of caterpillars into beautiful butterflies and moths, and eventually published several books incorporating her artworks such as the three-volume *Blumenbuch* (Book of Flowers) and two-volume *der Raupen wunderbare Verwandlung, und sonderbare Blumen-nahrung* (Caterpillars, Their Wondrous Transformation and Peculiar Nourishment from Flowers).

Most remarkably, she set sail on a five-year-long project to Suriname in South America on a grant, which was unheard of for a woman to receive in those days. She made the most of the opportunity and explored the land for new species of plants and insects. She created great illustrations of them and other animals of the land and published in 1705, the most momentous work of her career, *Metamorphosis insectorium Surinamensium* (The Metamorphosis of the Insects of Suriname). The book turned out to be one of the very first illustrated accounts of Suriname's natural history. Her intelligent and skillful illustrations contributed immensely to the science of entomology.



MISTAKEN IDENTITIES

For long, spotted hyenas *Crocota crocuta* were wrongly regarded as hermaphrodites. This was because of the unusually structured genitalia of the females. Female spotted hyenas sport long clitorises which almost look like penises. These long female genital organs work as passages for passing urine, for mating and even as passages for giving birth. Not only that, this organ can even become erect like a pseudopenis. The female hyena's labia, which is bulbous and fused gives the impression of a scrotum, which makes gender differentiation an even more confusing affair! No wonder then, that these animals had people believing they were hermaphrodites and some even believed that they possessed supernatural powers that enabled them to change their genders!

Spotted hyena
Crocota crocuta



Did You Know?

Female lightning-bikes have one flash pattern to attract males of their own species with whom they then mate, and another that mimics the pattern of a different species. Males of other species lured in by the false flashes are eaten.

SUPER MERMAIDS

Along certain villages off the shores of Japan and Korea, there are women who exhibit some amazing, physically challenging skills every day. They are the *ama*, which means 'sea woman', and are literally women sea divers. These women go foraging deep, all the way to the ocean floor, in search of shell fish and edible seaweeds, without any breathing or swimming equipment, only relying on their highly developed and evolved breathing techniques. And these spectacular feats by these women divers have been ongoing for almost two thousand years. You will find mentions of *ama* in Japanese history scriptures from as far back as the 8th century. These women can descend to staggering depths of upto 25 m. and can hold their breath for up to two minutes, after which they come up for air for brief intervals and dive back again in search to the bottom of the ocean. Today, there are some 20 to 30 thousand *ama* in Korea and Japan who deep sea dive for a living.



LIFE OF A QUEEN

The honeybees that people most often see are those working tirelessly – foraging for nectar, pollinating flowers, building

hives, and more. To circulate air within their hives, they even beat their wings rapidly! And these are just a few of the tasks with which these workers of the kingdom are assigned. All these worker bees are females, albeit sexually underdeveloped. The protagonist in the bee hierarchy is the queen bee. And all of the 'other bees' functions revolve around serving Her Majesty. The queen's job is laying eggs and keeping the kingdom populated. She regulates all the activities within the hive by producing chemicals that influence the behaviour of her subjects so they do not go astray and remain true to her. Interestingly, when the sole queen of a hive dies, the worker bees immediately get down to the task of choosing among them, the next queen. The chosen worker bee is put on a special diet, that includes food known as 'royal jelly' that transforms the sexually underdeveloped worker bee into a fertile queen, ready to reign supreme in her hive. No wonder the male bees are referred to as 'drones'.

MARY ANNING (1799 – 1847)

-- FOSSIL HUNTER, PALAEOONTOLOGIST

Mary Anning is celebrated as the scientist who made what are perhaps the most significant and astounding geological finds ever. Born in a small seaside town, on England's south coast, called Lyme Regis, Mary was introduced to the wonders of fossils, known as "curiosities" at the time, by her father at a very tender age. She was only 12 years old when she unearthed the first complete specimen of an ichthyosaur (a large, marine prehistoric animal, also known as 'fish lizard' that died out about 65 million years ago). In 1824, she made another, and perhaps the most scientifically important of all her discoveries, when she found an almost intact fossil of a plesiosaur *Plesiosaurus dolichodeirus* (gigantic marine reptile with a long neck that swam the oceans and first appeared about 200 million years ago.) This find created a worldwide sensation and catapulted her to immense fame and honour for her incredible contribution to science. She was a much sought after expert by the geologists and palaeontologists of her time.



Mary Anning and her fossil finds did more than just contribute to science. She showed the world, which then harboured contorted notions of biblical "darkness" during prehistoric times, that there existed a time before the "divine creation" (man) that was very different from the present. People then started to think about evolution. Her work along with others, gave geology a legitimate space in the arena of science as a respected discipline of its own by the time she passed on.



Plesiosaur fossil

Did You Know?

A male bat bug stabs the female in the abdomen with its needle-like penis and injects sperm directly into the bloodstream, even hurting the female. This practice is termed as "traumatic insemination".

ALL FEMALE KINGDOM

There is a reason why animals copulate and why two separate genders exist. This strategy has worked out quite well for most animals as it allows and maintains genetic diversity, mitigating the impacts of inbreeding that could wipe out entire species on account of unfavourable mutations in the genes and a lowered ability to adapt to changing conditions. But, Bdelloids, microscopic organisms belonging to the class of rotifers, seem to have quite effortlessly defied logic baffling evolutionary biologists. No male Bdelloid rotifer has been found since the species' discovery and studies tell us that this all-ladies group has gone without having sex for a good 80 million years. These asexual females simply produce daughters genetically identical to them through eggs that do not need any kind of external fertiliser like sperm to form an embryo.

How have they managed to circumvent the dangers of inbreeding? The answer lies in their unique genetic make-up that has held them in good stead all these years. A theory also goes, that these tiny animals might actually be "stealing" genetic material from other organisms that they engulf as food and this helps them maintain the necessary amount of genetic diversity. Talk about female power!

There are other examples of 'no need for males' in the animal kingdom. The female Komodo dragons have been recorded to give virgin births.

Bdelloid rotifers (above) are extremely tough and hardy microscopic creatures which can survive drought and intense radiation.

WHY SEXUAL DIMORPHISM?

Reproduction is the sole ambition of any organism. Propagation and the passing on genes to the next generation seem to be the only agenda. No wonder then, genes are often called "selfish". The very fact that sexual dimorphism has evolved by means of natural selection, to reach manifestations we see today, adds weight to the 'selfish gene' theory. Certain physiological manifestations seem, on the surface of it, to be disadvantageous to the organisms. Take, for example, the Common Pheasant. The males are brightly coloured, and females look drab. But, such bright colours make the males conspicuous and easy targets for predators, while female pheasants are better camouflaged. Thus, on an average, the male pheasant does not survive for more than 10 months, while females may survive for a couple of years. The flamboyance offers males early sexual reproductive success, which obviously trumps long-term survival in the game of gene propagation. So, are we, as organisms just mere vehicles for carrying these genes, wherein they can mutate, maximise and propagate? According to Richard Dawkins, organisms are motivated by their genes and not by their own free will. Now there is a thought for Sanctuary readers!



Common Pheasant *Phasianus colchicus* - female (left) and male (right)

Did You Know?

Clown anemonefish start out as male. If the female dies, the dominant male can change its sex and become a female.



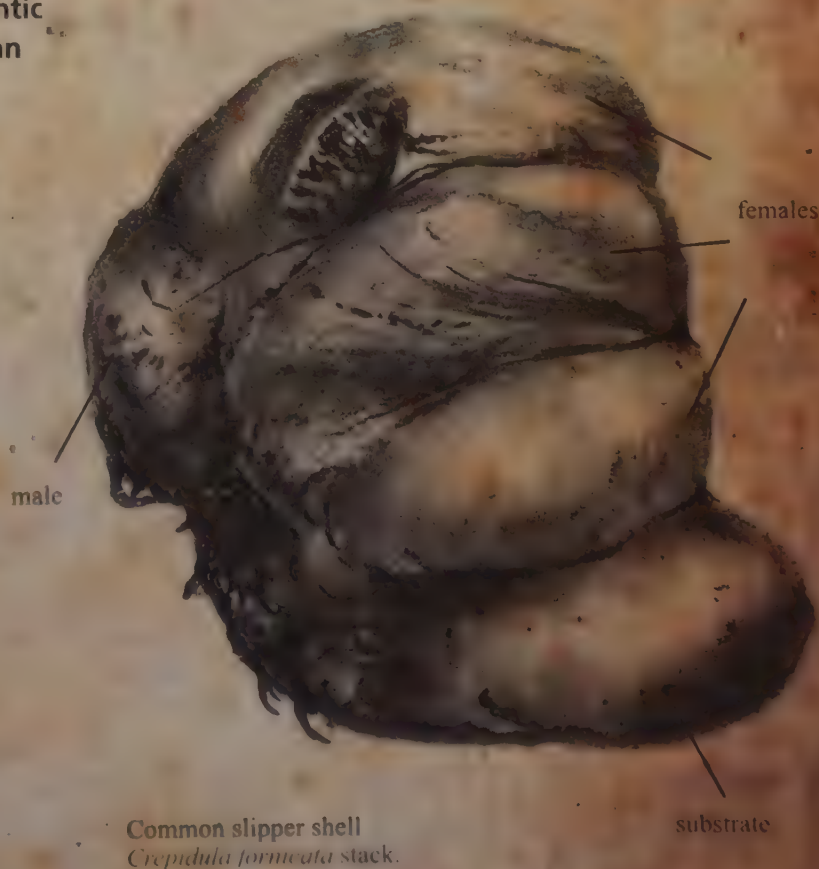
Map illustration (above) depicts the migratory route of the grey whales. Interestingly, these animals traverse very close to the shore in their 8,000 - 11,000 km. long travel route, making it one of the few whale migrations observable from land.

GOING ALL THE WAY

Grey whales go all out and far out to ensure the protection of their would-be young ones... literally. Pacific grey whales *Eschrichtius robustus* migrate southwards every year, swimming thousands of miles from the plankton-rich waters of the Arctic to tropical lagoons in Baja California, Mexico to give birth. Here, food scarcity plagues these worn-out mothers but, at least, these waters are free of one of the biggest threats to whale calves, orcas or the killer whales. And the calves, once born, spend their vital initial months in these lagoons, feeding on mother's milk, which is rich in fat, so the young ones can develop the insulating blubber needed to brave the freezing waters of the cold Arctic before heading back to their feeding grounds. But, in all this, the mother suffers months of starvation during which she loses up to eight tonnes of body weight! What mothers won't do for their little ones!

GENDER ORDER

Common slipper shells *Crepidula fornicata* are almost always found in stacks of upto 12-15 animals, with the bottom most attached to a substrate such as a rock. Okay, so they stack up on each other, big deal. In this case, it is a big deal. The order in which they are stacked determines gender! The bottom-most ones are much larger and are almost always females while the individuals stacked atop are smaller and males, though certain ones in between are under the process of changing their genders. These assigned genders are rotational. When the female dies, the next male in the pile will take her place by turning into a female, which it achieves by way of emasculation that involves getting rid of its penis. Meanwhile newer males will take the position at the top. A common slipper shell starts out as an immature male, and in due course will change its sex to female. The mature males extend their penises to copulate with females downstairs. This gathering of the common slipper shells could well be called a sex stack.



Did You Know?

The *Doryteuthis opalescens* female squids have special light-reflecting cells that can create the illusion of testes as a form of natural defense and for escaping unwanted male attention.



BOOK REVIEWS

GREEN SIGNALS: ECOLOGY, GROWTH AND DEMOCRACY IN INDIA



By Jairam Ramesh

Published by Oxford University Press India, 2015

Hardcover; 616 pages;

Price: Rs. 850/-

He is one of India's savviest politicians with a temperament to court controversy. As Union Minister of Environment and Forests with the UPA government between May 2009 and July 2011, he surely made 'green' issues press-worthy. He was often accused by

industry of stifling India's growth. Environmentalists acknowledged his intelligence and willingness to listen, but felt let down by the continuing trend of clearances to several ecologically damaging projects, such as the POSCO steel plant that continued apace during his tenure. However, given the current NDA government's lack of transparency, unwillingness to debate environmental issues and one-track mind motivated by business interests, Jairam Ramesh's tenure seems almost golden in hindsight.

The environment seems to still be on Ramesh's mind – his book *Green Signals: Ecology, Growth and Democracy in India* – is an offering that aims to suggest ways to balance development and environment protection. At about 600 pages, the book does not make light reading but is a valuable and well-written reference to understand the workings of the MoEF. By providing a record of the 25 months he held office, Ramesh gives the reader an insight into the opaque workings of the Ministry and the factors that often influenced decisions.

Ramesh traces his own development from being agnostic about the environment to someone who began to care, and outlines why growth can no longer afford to be exclusive. He writes, *"The pulls and pressures of our ever-changing world made one thing clear that environmental concerns could no longer be the also-ran in our relentless pursuit of higher GDP growth. Not only would environmental concerns have to be at the core of larger economic decisions but, sometimes, it would even have to be the driving force."*

Ramesh's tenure saw him take on a variety of issues from genetically modified brinjal and uranium mining in Manipur to the Jaitapur nuclear plant and mining in Niyamgiri – and each are elaborated on in the book. His 'speaking orders, speeches, parliamentary questions and responses and letters are also included. He also devotes several pages to the vital issues of energy demand and the go-no-go coal mining controversy. Climate change policies are particularly discussed in detail, perhaps a reflection of his current position as Chair of the Future Earth Engagement Committee.

His main goal as Minister was to bring in openness and accountability, a task he did undertake with all seriousness. However, his ideology that the environment decision-making process should not be tampered with – that due processes must be followed whether the eventual decision is in favour of the environment or not – has already been muzzled by the current

government. Ramesh writes, *"The debate is really not one of environment versus development but really one of adhering to rules, regulations, and laws versus taking the rules, regulations, and laws for granted."*

And therein lies the Achilles heel. Environmental laws continue to be at the mercy of the government at the helm – and today the environment ministry has once again become nothing more than a clearance stamp.

Reviewed by Lakshmy Raman

DREAMING IN CALCUTTA AND CHANNEL ISLANDS



By Shubhobroto Ghosh

Published by Power Publishers

Soft cover; 224 pages;

Price: Rs. 320/-

Individual vs. species, zoos vs. no zoos, Western ways vs. Indian and so on. Such intellectual, ethical and emotional conflicts plagued Shamu right through his impressionable years as a child growing up in a traditional and crowded Calcutta (Kolkata) household and as a young adult when he traveled to England and the

quaint Channel island of Jersey to fulfill his dreams of working for animal welfare.

This book is an earnest account of protagonist Shamu's life growing up, torn between his voracious and curious mind that revolved around the world of animals and his hero Gerald Durrell; and his travails of failing to understand people's mundane ways, and lack of any inclination towards books and animals, and worse, being expected to fit in. Through the entire account that unfortunately falters at points by either randomly digressing through various issues and unforgivable editorial gaffes; it does manage to hold you by its sheer honesty, simplicity, and sensitivity with which it talks about animals issues.

The author brings to fore the age-old debate on the existence and need of zoos and the plight of captive animals in India and the west. The accounts that Shamu divulges of various zoos that he visits in Northeast India as a part of a voluntary survey he conducts for Born Free foundation is heartbreaking. The extreme apathy extended by governmental bodies such as the Central Zoo Authority of India leaves you with almost no hope. His realisation of how animals in zoos, uprooted from their natural surroundings, begin to exhibit abnormal, atypical behaviour due to stress, boredom and debilitating frustration is well depicted.

One would think, animal welfare and rights and conservation would go hand in hand, which it should. But, here the author brings up this interesting dilemma of how conservationists tend to put species above the individual animals.

Through the spiritual journey of Shamu, as he understands, loves and empathizes with the animals, resolutely works on his dreams and aspirations and overcomes obstacles, the book encourages you to ponder over ethical issues of wildlife protection. It opens your eyes to the most glaring truths, elusive to most of us, who are carried away by propaganda rather than reality.

Reviewed by Purva Variyar

MOEFCC, Drop the Clause!

India's wildlife has for decades had one sturdy safety net – progressive legislation. The country's visionary *Wildlife Protection Act, 1972*, has, despite poor implementation, safeguarded our natural wealth from all manner of exploitation and abuse, successfully preserving much of our wildlife.

Now, an unconstitutional clause proposed in a Draft Wildlife Policy circulated by the Ministry of Environment, Forests and Climate Change (MOEFCC) could legalise the killing of rare wildlife species in the name of religion and culture. The 'innocuously' framed policy states:

"Keeping in view the fact that traditional practices involving wild animals are prevalent and in almost all cases, there are confrontation between the enforcement authorities and communities on these aspects, it is desirable to distinguish between "Hunting" and specified religious/cultural practices of communities involving wild/scheduled animals. The regulations for appropriate safeguards and prevention of cruelty can be provided in the Act."

The consequences of accepting such a policy will be devastating. With no clear definition of 'traditional, religious and cultural' practices, gaping loopholes are being created to enable the capture

and hunting of endangered and not-so-endangered species.

Globally, the 'legal' trade in wild animals and their derivatives serves as a cover for the hardcore global wildlife trade, which is directly in league with narcotics, arms and human trafficking. A case-in-point is Thailand's infamous 'tiger temple', which after years of profiteering from unsuspecting tourists was raided earlier this year for its links to wildlife crime syndicates and the gross mistreatment of captive tigers. In light of such instances, conservationists are concerned that the proposed clause will be abused by those with ulterior motives.

Beyond the obvious unethical tone of this clause, is the mere fact that such a step would be against the very spirit of the Indian Constitution that clearly declares that *"It will be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures."*

Supreme Court advocate and environmental activist Ritwick Dutta of the Legal Initiative for Forests and Environment, reiterates this message. "The draft is at present being formulated by a high-level committee chaired by former cabinet secretary T. S. R. Subramanian. It has recommended that different communities across the country can use animals for their cultural practices. This is completely against the cultural ethos, provisions of law and conservation requirements," he told reporters.

A consortium of non-government organisations came together to appeal to the ministry to remove the proposed clause. In a letter drafted by the Bombay Natural History Society, and endorsed by Aaranyak, the Wildlife Protection Society of India and TRAFFIC – India, the petitioners wrote, "Controlled killing of animals has historically fuelled poaching and black markets of wildlife products. This will encourage the existing black market of several threatened species protected under the Indian *Wildlife Protection Act*."

For organisations that have worked relentlessly to halt the damage caused by cruel traditions such as wild animal sacrifice for black magic, snake charming, bear dancing and ivory carving, this clause will set India back decades. And all the hard work dedicated to sensitising and rehabilitating former communities that depended on such trades will come to naught. Ditto the emotional and financial investment made in creating centres for the rehabilitation of rescued animals.

Nobel Peace Prize winner Albert Schweitzer said, "The thinking (person) must oppose all cruel customs, no matter how deeply rooted in tradition and surrounded by a halo. When we have a choice, we must avoid bringing torment and injury into the life of another." *Sanctuary* readers and wildlife supporters are urged to register their protest with the Ministry of Environment, Forests and Climate Change. Write in your individual or institutional capacity and insist that they 'Drop the Clause!' 🐾

Several organisations have already urged Environment Minister Prakash Javadekar, to remove the proposed clause. Add your strength to their appeal by independently writing to the minister as members of civil society who are interested in the protection of the country's wildlife.

Make sure to mention:

1. The clause is unconstitutional and in direct conflict with the *Wildlife Protection Act, 1972*.
2. The clause can easily be exploited by wildlife crime syndicates and act as a cover for their illegal dealings.
3. Cruelty in the name of tradition must be abolished, especially when it could tip species into extinction.
4. India's wildlife is unique and precious; all efforts must be made to protect it.

Address your letters to:

Shri Prakash Javadekar

MOS (IC) Environment, Forests and Climate Change, New Paryavaran Bhavan (4th floor), Jor Bagh, New Delhi – 110003.
Or e-mail him at:
prakash.j@sansad.nic.in
mefcc@gov.in

With a CC to:

editorial@sanctuaryasia.com



The cruel but culturally sanctioned practice of forcing sloth bears to dance on the streets could be legalised under the clause.

Waste Warriors

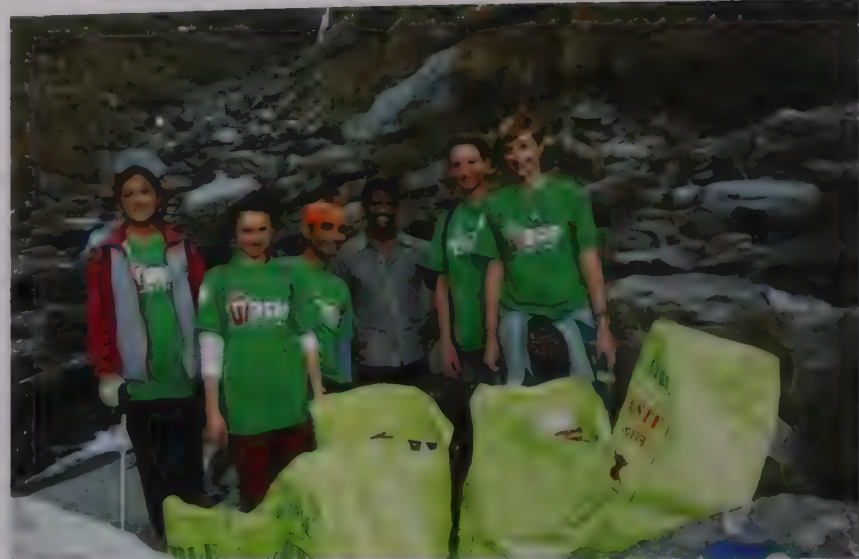
By Anirudh Nair

A Google search for 'waste in the Himalaya' throws up some very shocking results. Sample these headlines of news stories: 'Himalayas in danger of becoming a giant rubbish dump', 'Plastic waste may trigger water bombs in Himalayas', 'Too much human faeces on Mount Everest, says Nepal'. Beyond these attention-grabbing headlines are some shocking facts and figures that reveal how waste generated by humans on treks to the mountains is contributing to global warming, melting glaciers, glacial lake outbursts, and ecosystem deterioration.

Following the recent ecological disasters in the region, individuals and organisations are waking up to the gravity of the dangers posed by improper land and waste management. When British national Jodie Underhill first came to India as a tourist in December 2008 and volunteered at the Tibetan Children's Village in Dharamsala, the garbage situation in the mountains bothered her. In April 2009, she organised a mass clean up at McLeod Ganj. Over 100 people volunteered to clean the area reinforcing her belief that she wasn't the only one who wished for cleaner surrounds. Waste Warriors was formed in 2012 and what started as a weekly waste-collection programme from Triund, a remote but garbage-stricken mountain camp located four hours away from McLeod Ganj, expanded to the Guna Mata temple, the Bhagsunag Waterfall, and then further to Dehradun and the Corbett landscape in Uttarakhand by 2013.

Waste Warriors now employs 55 permanent staff members across their Dehradun, Dharamsala and Corbett chapters. "Our employees work with utmost dedication despite many pitfalls. We are most grateful to those who volunteer with us both as interns and on a long-term basis at a pittance, sharing in and inspired by our aspirations," says Shanti Verma, President, Waste Warriors.

The projects in Dehradun are based on a community-participation model, where after cleaning an area, staff is employed to collect waste and conduct waste management awareness drives for locals. In Dharamsala, a weekly hike is undertaken to Triund, where waste is collected on the trail, from tea shops and at the camp site; and segregated, to be brought back to their headquarters in Bhagsu. They also provide a door-to-door waste collection service for the residents of Bhagsu, apart from conducting weekly clean ups at the Bhagsu Waterfall. In Corbett, Waste Warriors collect, process, transport, store and dispose waste from 800 homes, 200 shops, 16 schools and seven hotels from 18 locations, which include 17 villages and a forest office in Ramnagar town. They aim to take this project to over 120 villages across 100 sq. km., where waste management systems are non-existent. "It's really easy and very much possible, if we put our minds to it," says Minakshi Pandey, Project Manager, Waste Warriors Corbett. The success of the Corbett chapter has been facilitated by the support of Club Mahindra and Anand Mahindra, who donated Rs. 25 lakh each for one year of operations. Waste



Volunteers with waste collected from the weekly Bhagsunag Waterfall clean up in Dharamsala, Himachal Pradesh.

Warriors have a 'no-burning policy' and segregate all the collected waste, of which organic matter is composted, recyclables sold to local recyclers and only non-recyclables sent to dumping yards. After conducting a clean-up drive, their staff works hard to maintain the area by placing dustbins, and encouraging people, through awareness campaigns, to use them. Waste Warriors works with Microsoft on a programme called 'Create to Inspire', which provides guidance to teachers on how to conduct environmental activities for students to inspire them to make positive changes in their own lifestyles. Special days are set aside for children every month, where they are taught about waste management through art, crafts and games.

In recognition of the organisation's work, CEO and co-founder Jodie was awarded the Amazing Indians Award in 2012, the Assocham Grassroots Women of the Decade award in 2014 and the Service Above Self award by Rotary International in 2015. The organisation also received a grant of four lakh rupees from the Mahindra Rise competition that supports new ideas. Their efforts to recycle 98 per cent of the waste generated at the Airtel Hyderabad Marathon in 2013 and making the Shimla Ultra Marathon in 2014 a zero waste event drew acclaim from all quarters. Triund, from where it all began, is now known as one of the cleanest hiking destinations in India.

"Working with waste in India was never meant to be an easy task, but people are slowly starting to realise the importance of our work. We are creating models that will one day change the way waste is managed and perceived across India," says Jodie.

CONTACT:

Shraddha Zende

E-mail: info@wastewarriors.org

Website: www.wastewarriors.org

Address: 144/4, Rajpur Road, Jakhan, Dehradun, Uttarakhand - 248001

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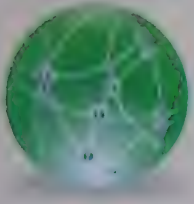
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NETWORKING

The rise in India's tiger population has prompted the Ministry of Environment and Forests to mull over the creation of new tiger reserves in the country. Three new reserves are being planned in the central and eastern states of Madhya Pradesh, Chhattisgarh and Odisha, and will take the total number of tiger reserves in the country to 50.

COMMENTS

These are tiger reserves that were proposed years ago.

– Prerna Bindra, Gurgaon

The state notification of these tiger reserves are still pending. Securing wildlife corridors should be primary priority.

– Deepak Verma, Pune

Instead of creating more parks, first let us secure wildlife corridors so that our parks don't become islands unto themselves.

– Dilip Chacko, Chennai

This is the only way to increase the areas brought under the Protected Area category. What they are finally labelled as is immaterial. At the same time, it is unfortunate that grasslands, wetlands, scrublands and deserts are neglected due to the importance we give to tiger reserves.

– Indrajit Ghorpade, Bengaluru

Wonderful news indeed! The flip side would be the mushrooming of resorts and rampant human encroachment, which goes against the very objective of giving more space to the tiger.

– Sanjay Browne

A great idea as long as they are not reserves such as Mukundra Hills with no tigers in them. Mukundra is a degraded habitat, and has not had tigers for the last four or five decades. When tigers were air dropped from Ranthambore to Sariska, it created such a disturbance that we did not see any breeding among tigers in Ranthambore for a while and Sariska's tigers also had an extremely slow reproductive rate. It makes more sense to declare reserves where tigers do exist, or have existed in the recent past and in 'proven' corridors. This has been implemented successfully in places such as



Ratapani in Madhya Pradesh is one of the three tiger reserves that has recently been accorded approval by the National Tiger Conservation Authority (NTCA).

the greater Tadoba landscape in Maharashtra. A much better idea than wasting resources and tigers, if you plan to relocate some, on a literal 'shot in the dark' like Mukundra.

– Ishan Dhar



VIRAG SHARMA

We shared a picture of insensitive 'tiger tourism' from Ranthambhore, you shared your opinions:

TWEETS

Wildlife photography tours have a lot to answer for. Cheap flights, cheap equipment, mean more people want 'that' shot.

– Wayne Marinovich@WM_Books

Terrible and shameless. That's the reason I have been avoiding a certain tiger park. Personal ban.

– The Untourists@theuntourists

Sadly this has meant most wildlife safaris are about spotting a big cat. Even elephants are hurried past to get to tigers.

– Vaidya@aydiav

That's awful! I think the guides have acted badly here: they should retreat to a respectful distance.

– neil@4nks

Sadly many tiger reserves are tiger circuses now. Part of the problem are selfie-with-tiger takers and phone photographers with no zoom.

– Gypsy Shack@Gypsyshack1

The way out is tourist-driver-guide combo taught to respect the tiger.

– anand@savetigeranand

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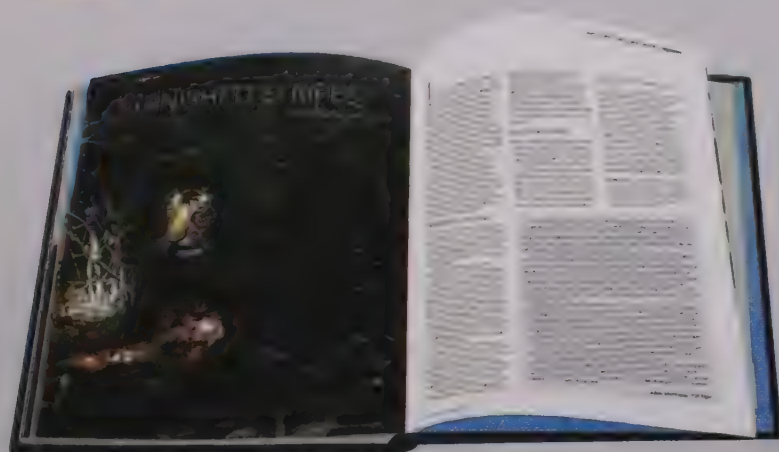


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READERS' FORUM



THE FOREST OF IMPROBABLE DREAMS

Congratulations for publishing the amazing story of the rehabilitation of Himalayan black bears and the tireless efforts of the Wildlife Trust of India. I was fortunate enough to be associated with the pioneers of this project a decade ago. It was an experience of a lifetime and reading the article in your magazine brought back some amazing memories. In Arunachal Pradesh, it is not unusual to hear about bears becoming orphaned, however, it is heartening to know that some fortunate cubs are being rescued and rehabilitated.

*Darge Tsering,
Guwahati*

THE DOMESTIC WILD

A farmer from Bengal's Midnapore district discovered an orphaned kitten that he took home and raised. To his surprise, the kitten grew far beyond the dimensions of any domestic cat. When the news became widespread, the fishing cat was confiscated and moved to a zoo. See more at: <http://bit.ly/1FqOgfX>
Sanctuary readers respond:

Even though Golu is a wild cat, I'm sure he is missing his foster parents who nurtured him and treated him like their own kid. The zoo authorities

should let them come and meet Golu.

*Vandana Bajikar,
Michigan*

Hopefully the zoo will provide well for this fishing cat.

*Eva Seifert-Aragon,
Colorado*

I hope the foster parents are allowed to visit him in the zoo and he has a big enclosure, unlike the rotten ones at Alipore Zoo. I hate zoos, but this cat doesn't stand a chance in the wild since he was hand reared.

*Saileena Sarkar,
Kolkata*

PROTECTING TIGERS OUTSIDE FORESTS

I wish to ask some serious questions about tiger conservation and the role of the National Tiger Conservation Authority (NTCA). I have sent repeated emails seeking help to confirm the presence of tigers in new areas

of Gujarat and Maharashtra to many government officials, but haven't received a response till date. It makes me wonder if the government is only serious about protecting tigers in national parks and sanctuaries. Are the areas from where reports of the presence of tigers emerging not important? What is the status of the tigers in such areas and have any steps been taken to protect them? Is all the funding reserved only for Protected Areas? The lack of response to my queries makes me doubt the will of those entrusted with the task of protecting India's national animal. And it is not only tigers, there is an urgent need to protect the flora and fauna in Nashik, Ahava Dang, Nandurbar, Narmada, Dhule, Jawahar and Mokhada, where degradation of forests have become the norm. I can only hope that my voice will reach concerned officials through *Sanctuary Asia* magazine.

*Amit Khare,
Nashik*

The Vadoda Forest Range is a significant tiger habitat in Jalgaon district and was rechristened as the Mukta-Bhavani Tiger Conservation Reserve thanks to Praveen Pardeshi, Principal Secretary at the office of the Maharashtra Chief Minister. Unfortunately, a tigress died

recently in the Dolarkheda Beat No. 572 of the range. The Forest Department was unaware of the incident and learned about it from a local shepherd after 10 long days. The local RFO Madhukar Nemade should have been more vigilant as he knew of the continual sightings of the tigress, which was ill and not able to move to safety because of antagonism from villagers. At one point it had become so weak it could not even kill cattle in the vicinity of the Vayla and Dolarkheda villages. The post-mortem was conducted only on April 1, 2015.

It's time that staff not suited to or not inclined for wildlife work be kept away from such postings.

*Rajendra Nannaware,
Jalgaon*

34 YEARS AND COUNTING

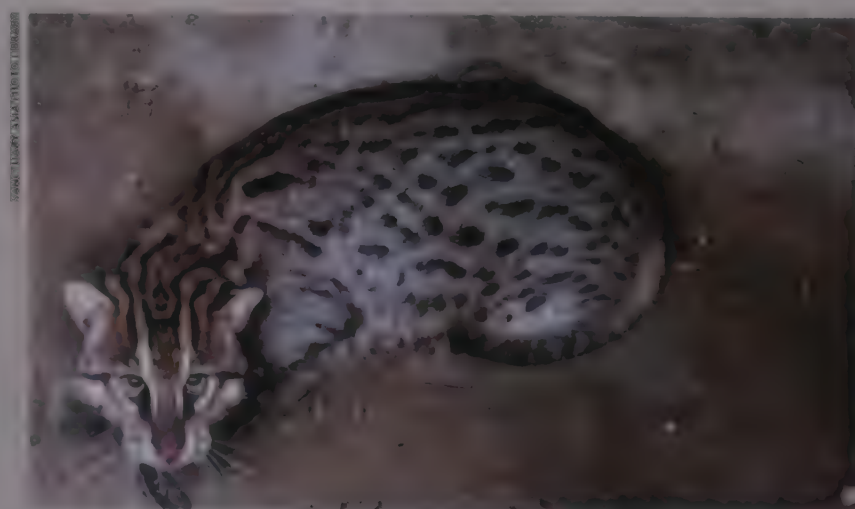
I never knew about *Sanctuary Asia* magazine until I recently saw a copy at a store. It's a wonderful journal with some amazing articles and photographs. Hopefully one day one of my wildlife images will make its way into your pages.

*Taha Ahmad,
New Delhi*

I received my first-ever copy of *Sanctuary Asia* magazine today. And it is breathtaking. There is so much to learn from the information-packed pages. I am going to work hard to get my photography work published by you.

*Ashwin Deshpande,
Bengaluru*

Though I am relatively new to the *Sanctuary Asia* family I have always been a wildlife enthusiast. I recently subscribed to the magazine and really appreciate the quality of the *Sanctuary Asia* Facebook page



as well. It is a good platform for amateur photographers like me to interact with experienced photographers and travellers. It would be great if Sanctuary Asia could develop an application, which allows wildlife enthusiasts across the country to organise field trips and address local issues. The app will also allow us to post photos and videos to document wildlife sightings and track animals.

*Nishant Lakhota,
New Delhi*

The posts on the *Sanctuary Asia* Facebook group are a distinct improvement. I like the fact that photos and posts that match your goals are being curated and shared. This is vastly better than a free-for-all with competing photographers merely trying to outdo each other and focused on the image to the exclusion of issues. My recent post on the Greenpeace bank accounts being frozen by the Indian government was liked and shared by an impressive number of people. Photographers' works are also being showcased and the group is serving a vital networking function for us all.

*Phil Carter,
Oita*

PM MODI ON CLIMATE CHANGE

I cannot understand Prime Minister Modi's take on climate change, which does not seem rooted in reality. India desperately needs to adopt green technologies that have been tried and tested in other nations, duly improvised to suit Indian conditions. Non-renewable energy sources are a thing of the past.

*Siddi Mysore,
Bengaluru*

BIODIVERSITY OF COORG

I recently spent a weekend at a friend's coffee estate in Madikeri, also known as Coorg. Spread across 50 acres, the estate nestles

in mountain ranges and valleys clothed with dense vegetation that harbours an incredible diversity of birds. While exploring the thick woods, my attention was drawn to a hole in one of the tree trunks and I saw something being shot out from a hole. I waited quietly for a while and to my delight saw a Malabar Grey Hornbill fly out and perch on a nearby tree. A few minutes later it returned to the hole to feed its young. It was a male that had swallowed a whole lot of edible morsels including fruits and large insects, which it regurgitated one by one to feed its mate and chicks. I know that *Sanctuary* does not encourage nest photography, so I am not sending any images, but the experience was nothing short of magical.

*Vasudevan Parthasarathy,
Bengaluru*

WOMEN IN CONSERVATION

The *Sanctuary* magazine invitation to write for its women's special issue came at a time when I have been pondering about the role of women in wildlife conservation. There are many of us – researchers, biologists, conservationists, naturalists, writers; united by their love of nature and the goal of a better, greener planet.

And that is where the idea of a forum for 'Women in Conservation' was born. We hope to bring women leaders to the forefront and aim to provide a forum, a network to support and celebrate the role of women in conservation. Those interested in being a part of this, write to me at prerna@bagh.org. We are currently working on social presence for the forum.

*Prerna Singh Bindra,
New Delhi*

Next Issue

On the Trail of the Whistling Hunter

Dr. Kate Jenks is washing clothes when her transmitter starts to beep. A dhole is on the move, she must give chase! For the past several years, Dr. Jenks has been studying the dholes of Salak Pra and Khao Ang Rue Nai Wildlife Sanctuaries in Thailand. In a snappy first person account, she takes *Sanctuary* readers into the field and details how the data her team collects will be used to map conservation strategies for Thailand's forgotten wild dogs.



ANIRUDDHA DHAMORIKAR

Assassins of the Undergrowth

In the Kanha Tiger Reserve, the towering stands of *sal* alone pay witness to the obligate carnivores of the macro world – spiders. **Aniruddha Dhamorikar** stirringly narrates his experience of studying the density and diversity of arachnids in Kanha, and perhaps, along the way, succeeds in repairing the reputation of this one invertebrate that almost everyone, inexplicably, loves to hate.

Camera Trapping in Bandit Land

At the sweet spot where the Eastern and Western Ghats meet, in the dry forests once ruled by the legendary bandit Veerapan, **Dr. Sanjay Gubbi** discovers the bounty of the Malai Mahadeshwara Hills. Notified as recently as 2013, this sanctuary is part of a vast tiger landscape, and sits at the cusp...of either greatness or ruin, depending on how it is managed.

Rush Hour at Khichan

Every winter, from dawn to noon, the sleepy Rajasthani village of Khichan transforms into a bustling *dhaba* for thousands of migrating Demoiselle Cranes. With a superb eye for detail, **Yashpal Rathore** showcases spectacular frames of Khichan's time-honoured visitors as they arrive to feed.

Conservation Voices

Not only did these women for our wilds carve a niche for themselves, their work has brought them much-deserved recognition and acclaim. **Swati Thiagarajan, Joanna van Gruisen and Keya Acharya** share their field experiences and life stories to carry forward our Conservation Voices series.

DEFENDING DISSENT

By Priya Pillai

You, dear *Sanctuary Asia* reader, are anti-national.

Do you love India's forests? Are you committed to protecting our wildlife? Ready to stand up to those destroying our environment, wiping off tribal cultures and polluting our rivers and atmosphere? Then in the eyes of the Ministry of Home Affairs (MHA), you may be considered anti-national, undermining India's economic interest and your motivations are suspect. The MHA has branded me and my colleagues at Greenpeace India as such, and virtually every *Sanctuary* reader, I imagine, would fall into the same boat.

If we do not stand up together to make our voice heard in defense of free speech and our right to fight for our forests, tigers, rivers and the millions who depend on them, we will be leaving behind a vastly poorer nation for our children. I for one will not let that happen. Join me. Make your voice heard.

Sign the petition to the MHA at www.greenpeace.org/india

Greenpeace activist Priya Pillai was stopped at Delhi airport on January 11, 2015 while heading to London to speak on the alleged violation of the forest rights of tribals in the Mahan coal block area of Madhya Pradesh by a U.K.-registered company. The MHA has since frozen Greenpeace India's bank accounts and the NGO is faced with the threat of shutting operations in India. - Ed.



REGISTER AT WWW.GREENPEACE.ORG/INDIA/EN/ TO GET INVOLVED

Follow Greenpeace India on: www.facebook.com/greenpeaceindia • www.twitter.com/greenpeaceindia

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Take a break and head for Kerala where delightful deals,
exclusive packages, exciting events and more await you.
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surprises, log on to www.keralatourism.org/visitkerala

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FOREVER STRIPES

The survival of the tiger and all the creatures that share its habitat, including leopards, wild dogs, elephants, rhinos and uncounted plants, insects, birds, reptiles and herbivores, depends on whether humans can set aside vast parcels of land for nature.

The wildlife conservation movement needs the support of us all. For more information on how you can help, or to pledge your support for those who work 24x7 to protect our wildlife, write to Dr. Anish Andheria (Director, Wildlife Conservation Trust) at anish.andheria@gmail.com or visit www.wildlifeconservationtrust.org

Issued in the interest of wildlife conservation

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